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THE CASSOWARY.

The Cassowary lives in Australia and New Guinea. Its glossy feathers are like hair, and its head is crowned with a helmet.

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No 1

SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(-) is the mark dividing words respelt phonetically into syllables; (′), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	*māt, fāt, fāl, ā.*
ă	mat, fat	*măt, făt.*
â	far, calm, father	*fâr, kâm, fâ′thėr.*
ä	care, fair	*cär, fär.*
aw	fall, laud, law	*fawl, lawd, law.*
ē	mete, meat, feet, free	*mēt, mēt, fēt, frē.*
ĕ	met, bed	*mĕt, bĕd.*
ė	her, stir, heard, cur	*hėr, stėr, hėrd, kėr.*
ī	pine, ply, height	*pīn, plī, hīt.*
ĭ	pin, nymph, ability	*pĭn, nĭmf, ă-bĭl′ĭ-tĭ.*
ō	note, toll, soul	*nōt, tōl, sōl.*
ŏ	not, plot	*nŏt, plŏt.*
ô	move, smooth	*môv, smôth.*
ö	Goethe (similar to *e* in her)	*gö′tėh.*
ow	noun, bough, cow	*nown, bow, kow.*
oy	boy, boil	*boy, boyl.*
ū	pure, dew, few	*pūr, dū, fū.*
ŭ	bud, come, tough	*bŭd, kŭm, tŭf.*
û	full, push, good	*fûl, pûsh, gûd.*
ü	French plume, Scotch guid	*plüm, güd.*
ch	chair, match	*chär, măch.*
ċh	German buch, Heidelberg, Scotch loch (guttural)	*bôċh, hī′dėl-bĕrċh, lŏċh.*
g	game, go, gun	*gām, gō, gŭn.*
j	judge, gem, gin	*jŭj, jĕm, jĭn.*
k	king, cat, cot, cut	*kĭng, kăt, kŏt, kŭt.*
s	sit, scene, cell, city, cypress	*sĭt, sēn, sĕl, sĭt′ĭ, sī′prĕs.*
sh	shun, ambition	*shŭn, ăm-bĭsh′ŭn.*
th	thing, breath	*thĭng, brĕth.*
ṫh	though, breathe	*thō, brēṫh.*
z	zeal, maze, muse	*zēl, māz, mūz.*
zh	azure, vision	*ăzh′ėr, vĭzh′ŭn.*

BULLION, n. *bûl'yŭn* [F. *bouillon,* a boiling, a boss, any great-headed nail—from mid. L. *bullīōnem,* a mass of gold or silver: F. *billon,* base coin: Sp. *vellon,* an alloy of silver and copper: mod. Gr. *boullono,* I seal or stamp: OE. *bullione;* OF. *boillion,* the mint or exchange]: formerly the mint where the precious metals were alloyed and made into money; the alloy or composition of the current coin permitted by the mint; gold or silver of the standard fineness, in any form not money—generally in small bars called ingots; gold and silver in the mass; foreign or uncurrent coin. Though bullion usually means uncoined gold and silver in bars or other masses, in discussions on the currency, the term is frequently used for the precious metals coined and uncoined. While in England bullion came to signify the standard metal of which the coins are made, in France, where the kings debased the currency much more than was ever done in England, *billon,* the mint, came to signify the base mixture issued therefrom.

It is still a question how far any great increase in the supply of bullion has that effect in lessening the value of money, and consequently raising prices, which has always been naturally attributed to it. It may indeed be maintained with some plausibility, that if bullion were capable of being produced to such an extent beyond the actual demand for it as to glut the market, it would cease to be that general standard of money value which it has become just because it is of all others the article which is steadiest in requiring a certain outlay of labor to produce it. Rise in prices has accompanied large supplies of gold, but it has accompanied large supplies also of other commodities indicative of a great increase in riches. It is certain that great increases in the supply of bullion do not, as in the case of other goods, glut the market. For some years past, the supply of gold, owing to the new fields opened in America and Australia, has been quadrupled, with certainly no more influence on prices than a general increase in prosperity might cause. There is, it will be observed, this great difference between gold and other commodities, that besides what may be within the earth, there is a great mass which has been accumulating for thousands of years in the possession of mankind, which comes forth as it is wanted. A few millions of tons of iron, or bales of cotton, beyond the usual annual average, would perhaps add a hundred per cent. to the available quantity for consumption; but a few millions of pounds worth of gold, having to be counted with all the gold in existence in the world, makes a scarcely perceptible addition to the stock.

The term bullion is in Great Britain associated with the memorable BULLION REPORT of 1810. In 1797, by what was called the Restriction Act, the Bank of England was restrained from paying its notes in gold.

There thus came to be two separate and independent currencies in the country—one of bullion, the other of paper. They came to differ in value from each other so much that in 1813, gold, of which the mint price was £3, 17*s.* 10*d.* per ounce, was actually worth in bank paper, £5, 10*s.*, or, in other words, the one-pound bank-note was worth 14*s.* 2*d.* There were various opinions on the cause of this difference. Some people simply said that gold was dear, taking paper as the standard of value; others said it was owing to the exports not balancing the imports; others, to too great facilities in discounting, by which money was advanced on bad security; and in general it was held that there could be no over-issue of paper money, if it was backed by good security, and employed only for genuine transactions, and not in fictitious credits. In the meantime, the select committee on the high price of gold bullion established the conclusion that paper money is always liable to be overissued, and consequently depreciated, unless it be at all times immediately convertible into gold, and the monetary policy of the empire was subsequently established on this principle.

BUL'LOCK, *bûl'ŭk*, Alexander Hamilton, American politician: b. Royalston, Mass., 1816; d. 1882. He was educated at Amherst College and the Harvard Law School and was admitted to the bar in 1841. After practising law in Worcester, Mass., he was elected to the Massachusetts House of Representatives in 1845 and re-elected in 1861, when he became speaker. In 1849 he became a member of the State Senate. He held many judicial offices, was mayor of Worcester in 1859, and from 1866–8 was governor of his State.

BULLOCK, Charles, English clergyman, editor and author; b. 1829, Feb. 24. He entered the Anglican ministry in 1855, was curate of Ripley, Yorkshire, 1857–9; of Luton, Bedfordshire, 1859–60; rector of St. Nicholas', Worcester, 1860–74. He has edited *The Fireside Magazine*, *Home Words*, and other periodicals, and among his published works are *The Way Home; The Royal Year; England's Royal Home; Shakespeare's Debt to the Bible; Popular Recreation; The Poet of Home Life; Biography of Frances Ridley Havergal; Crowned to Serve;* etc.

BULLOCK, Charles Jesse, American economist: b. Boston, 1869, May 21. He graduated at the Boston University in 1889, devoted himself to special studies, and was appointed to the chair of economics in Williams College. He is now professor of economics in Harvard University. He is the author of *The Finances of the United States, 1775–89* (1895); *Introduction to the Study of Economics* (1900); *Essays on the Monetary History of the United States* (1900); and has edited *Currencies of the British Plantations in North America.*

BULLOCK, Rufus Brown, American politician: b. Bethlehem, Albany County, N. Y., 1834, March 28; d. 1907, April 27. He was educated at Albion Academy and early in life went to Georgia in connection with a business enterprise. During the Civil War he was connected with the quartermaster's department in the Confederate army. In 1867 he became a member of the State Constitutional Convention of Georgia and in the following year was elected governor. His championship of the negro members expelled from the legislautre brought him such violent opposition that he resigned from office. He was actively engaged in the promotion of the railroad and industrial interests of his own State and was government director of the Union P. R. R.

BULLOCK, Shan F., Irish novelist: b. Crom, Fermanagh, Ireland, 1865, May 17. He has written a number of popular works. Among them are: *The Awkward Squads* (1893); *By Thrasna River* (1895); *Ring o' Rushes* (1896); *The Charmer* (1897); *The Barrys* (1899); *Irish Pastorals* (1901); *The Squireen* (1903); *The Red Leaguers* (1904); etc. His work is remarkably individual and his studies of life in the north of Ireland are faithful reflections of Irish life and character.

BULLOCK, William A., American inventor; b. Greenville, Greene County, N. Y., 1813; d. Philadelphia, 1867, April 14. He learned the trade of machinist and having started a periodical, *The Banner of the Union*, he invented a printing-press in connection with that enterprise. He removed to New York and devoted himself to the construction and gradual development of a planetary press, finally producing the Web perfecting press that delivers 30,000 papers per hour, printed, cut and folded. While handling one of his presses he met with an injury that proved fatal.

BULL RUN: A small stream in northeast Virginia, flowing into the Occoquan about 25 miles southwest of Washington; noted as the scene of two battles in the civil war. The first was fought 1861, July 21, the Union forces being led by Gen. Irwin McDowell, and the Confederates by Generals Jos. E. Johnston and Beauregard. Johnston commanded the Army of the Shenandoah, which had been lying at Winchester, opposing Gen. Patterson, who had marched south from Pennsylvania; Beauregard was in command of the Confederate 'Army of the Potomac,' and held the southern bank of Bull Run. When Johnston heard that McDowell was marching from Washington to attack Beauregard he skillfully slipped away from Winchester and Patterson and hastened to Beauregard's assistance. Beauregard was the Junior in rank, but as he had formed a plan of battle, Johnston yielded to him the command on the field. McDowell had 28,000 men; 10,800 of these he threw across Bull Run and attacked Beauregard's left. At 3 p.m. a Union victory seemed assured, but the Confederates forced the fighting, the tide turned and the

Union line gave way, recrossed Bull Run and retreated in disorder to the banks o fthe Potomac. The forces engaged were about equal, 18,000 on each side. As officially reported, the Union losses were 481 killed, 1,011 wounded, 1,216 missing; the Confederate losses 387 killed, 1,582 wounded, 13 missing. Twenty-nine Union guns were captured or abandoned.

1862, August 29, 30, a second battle was fought on the same field. In this battle General Pope commanded the Union forces, numbering about 65,000 men, and General Lee the Confederate forces, numbering about 54,000 men. The result of the two days' severe fighting was that the Union army was defeated and fell back to the defenses of Washington. The Union losses are not definitely known. It is estimated that they exceeded 10,000. The official reports give the Confederate losses 1,090 killed, 6,154 wounded, a total of 7,244. The battles are known to the Confederates as 'the first and second battles of Manassas.' For the Confederate movements immediately succeeding the second battle, see ANTIETAM.

BULLS AND BEARS: a popular phrase used in connection with the stock market. The term 'bulls' is applied to the operators attempting to force up prices, and the term 'bears' to those seeking to lower them.

BULL TROUT (*Salmo eriox* or *S. griseus*): fish nearly allied to the salmon, and like it, migratory, ascending rivers, in which it deposits its spawn, but living chiefly in the sea. It occurs in many of the rivers of Britain. It is frequently called the GRAY TROUT, sometimes simply the GRAY, and is the SEWEN of the Welsh rivers. It sometimes attains the weight of 20 lbs., although it is more commonly under 15 lbs. weight. It is less elegant in form than the salmon; the head and nape of the neck are thicker in proportion; and the tail, beyond the adipose fin, is more bulky and muscular; the tail fin is square at the end in young fish (in some places called *whitlings*), and in older fish becomes convex by the elongation of the central rays, whence the name *roundtail* sometimes given to this species. The scales are rather smaller than those of a salmon of equal size, and the color is less bright; the males in the spawning season being reddish brown, the females blackish gray; at other times the general color is like that of the salmon trout. The Bull Trout agrees with the salmon in having only a few teeth on the most anterior part of the *vomer* (the bone which runs down the centre of the palate), while the salmon trout, the common trout, and the great lake-trout, have a long line of teeth there; the teeth are larger and stronger than those of the salmon; there are differences also in the form of the gill-covers. To anglers the Bull Trout is next to the salmon as a prize, and by many is mistaken for it. The flesh is paler in color, coarser, with much less flavor, and much less esteemed.—The name Bull Trout has been given also to the HUCHO (*Salmo Hucho*), or salmon of the Danube, which sometimes attains the size of 30, or, it is said, even of 60 lbs.

AN ATTACK BY THE CONFEDERATES DURING THE RETREAT FROM MANASSAS.

BULLY, n. *bŭl'lĭ* [Dut. *bulderen*, to bluster: Ger. *poltern*, to make a noise: Sw. *buller*, noise]: a quarrelsome cowardly fellow; one who blusters and threatens: V. to insult with noise; to overawe by threats. BUL'LYING, imp. *-lĭ-ĭng:* N. the act of one who bullies. BUL'LIED, pp. *-lĭd.* BUL'LIRAG, v. *-lĭ-răg*, to insult in a bullying manner. *Note.*—BULLY is probably from BULL 1, in the sense of a rude, swaggering, quarrelsome man, behaving like a *bull:* Dut. *bul*, a bull, a rough unsocial man.

BULNES, MANUEL, *mâ-nô-el' bûl-nās*, Chilean soldier and statesman: b. Concepcion, 1799, Dec. 25; d. Santiago, 1866, Oct. 18. He served in most of the battles of the Chilean revolution. In 1838 he commanded the Chilean army of 5,000 men against Santa Cruz, in Peru, and was finally instrumental in driving Santa Cruz from the country, and breaking up the Peru-Bolivian confederation. In 1841 he was elected president of Chile and served for four years. He was afterward senator and councilor of state.

BÜLOW, BERNHARD, *bĕrn'hărt bü'lō.* COUNT VON, German statesman: b. Klein-Flotbeck, Holstein, in the spring of 1849. He came of a distinguished family, and was, on the mother's side, of Danish ancestry. He was educated at Lausanne, Leipsic and Berlin, studied law and served in the Franco-German war, where he rose to the grade of lieutenant. After filling the posts of secretary of legation at Rome, St. Petersburg, and Vienna, he became chargé d'affaires at Athens during the Russo-Turkish war, and later was secretary of the Berlin Congress. In 1888 he was appointed minister to Rumania, and in 1893 ambassador to Italy. He was called home to become minister of foreign affairs. His skilful treatment of the Samoan difficulty won him popular favor in his own country. During the Chinese complications in 1900 he fully supported the emperor's foreign policy. When Prince Hohenlohe resigned, 1900, Oct. 16, Von Bülow was called to succeed him as chancellor of the empire. He is also Prussian president of the council of ministers.

BÜLOW, BERTHA VON, *bâr'ta fōn*, German story writer: b. Warmbrunn, Silesia, 1850, Sept. 30. Among her stories which enjoy great popularity are *Merry Tales* (1891); and *Once in May and Other Stories* (1892). She has also written some good comedies, namely, *Theory and Practice* (1890), and *Two Peaceful Ones* (1892).

BÜLOW, *bü'lō*, FRIEDRICH WILHELM VON (Count Dennewitz). 1755–1818, Jan. 11: Prussian general in the war of liberation. He entered the army young, and soon distinguished himself. When Prussia declared war with France 1813, B. commanded in the first successful encounter with the French at Möckern, April 5, and revived the self-confidence of the army after the

adverse battle of Lützen. His victories over Oudinot and Ney at Grossbeeren and Dennewitz, saved Berlin, and inflicted severe loss on the enemy. He was conspicuous in the battle of Leipsic, and by taking possession of Montmartre, finished the campaign of 1814. The king acknowledged his services by an estate worth $150,000, and the title of Count Dennewitz. In the campaign of 1815, he joined Blücher by forced marches, and headed the column that first came to the aid of Wellington at Waterloo. He died at Königsberg.

BÜLOW, Hans Guido von, *hänts gwē'dō fōn*, German pianist and composer: b. Dresden, 1830, Jan. 8; d. Cairo, Egypt, 1894, Feb. 12. He studied the piano under Liszt, and made his first public appearance in 1852. In 1855 he became leading professor in the Conservatory at Berlin; in 1858 was appointed court pianist; and in 1867 he became musical director to the king of Bavaria. His compositions include overture and music to *Julius Cæsar*, *The Minstrel's Curse*, and *Nirvana;* songs, choruses, and pianoforte pieces. He was considered one of the first pianists and orchestral conductors. In 1875–6 he gave a series of concerts in the principal cities of the United States. His Letters appeared 1895–7.

BÜLOW, Heinrich, *hīn'rĭch*, von, German military writer: b. Falkenberg, in Altmark, about 1757; d. Riga, Russia, 1807. He studied in the military academy at Berlin, and afterward entered the Prussian service. But he soon retired, and occupied himself with the study of Polybius, Tacitus, and J. J. Rousseau, and then served for a short period in the Netherlands. He afterward undertook to establish a theatre, but immediately abandoned his project, and visited the United States, whence he returned poor in purse but rich in experience, and became an author. His first work was on the *Art of War*, in which he displayed uncommon talents. He wrote a book on *Money*, translated the *Travels of Mungo Park*, and published in 1801, his *History of the Campaign of 1800*. In 1804 he wrote *Lehrsätze des neuern Krieges* (Theory of Modern Warfare) and several other military works, among which is his *Tactics of the Moderns as They Should Be*. In the former he points out the distinction between strategy and tactics, and makes the triangle the basis of all military operations. This principle of his was opposed by Jomini, and other French writers. His history of the war of 1805 occasioned his imprisonment in Prussia, at the request of the Russian and Austrian courts. He died in the prison of Riga. He was a follower of Swedenborg.

BÜLOW, Karl Eduard von, *kârl ĕd-wârd fōn*, German author: b. Berg vor Eilenburg, Saxony, 1803, Nov. 17; d. Ottishausen, 1853, Sept. 16. His literary fame rests mainly on his *Book of Tales*, after ancient Italian,

Spanish, French, English, Latin, and German originals (4 vols. 1834–6), which was followed by a supplementary volume. Of his own original compositions, the *Springtide Wandering Among the Hartz Mountains* is one of the best. He wrote also the very interesting story of *The Youth of a Poor Man of Toggenburg*, founded on the autobiography of Ulrich Bräker, a Swiss weaver. He published the original later.

BÜLOW, MARGARETE VON, *mar-ga-rā'ta fōn*, German novelist: b. Berlin 1860; d. near there, 1885, Jan. 2. She wrote four volumes of stories, namely, *Stories* (1885); *Jonas Briccius* (1886); *Chroniele of the Riffelshausen Folks* (1887); *New Stories* (1890). She delineated character with great precision, and displayed true insight into the human heart. She lost her life in an attempt to rescue a boy from drowning.

BÜLOZ, *bü-lo'*, FRANÇOIS: 1803–77: b. near Geneva, Switzerland: French writer. He was educated in Paris, where he first became foreman in a printing office, and made his debut in literature by translations from the English. In 1831, he founded the *Revue des Deux Mondes*, which was the principal work of his life, and exerted a powerful influence on politics and literature. Since his death, it has been edited by his son. He published a complete summary of universal history (1850); and a number of other works.

BULRAMPUR': town of Oude, India, near the frontier of Nepaul; n. lat. 27° 24', e. long. 82° 15'; on the Raptee, in a plain; 90 m. n.e. from Lucknow. It is of considerable size, mostly of mud houses, covered with thatch. From B. there is a magnificent view of Dhawalagiri. The town is on one of the most frequented routes between Lucknow and Nepaul, so that during spring and summer it is thronged by traders, exchanging the products of Hindustan and Tibet. Pop. about 16,000.

BULRUSH, n. *bûl'rŭsh* [*bull*, meaning large, and *rush*]: popular name for large, rush-like or reed-like plants growing in marshes, not strictly limited to any particular kind. Some authors employ it in a restricted sense as the designation of plants of the genus *Typha*, known also as Cat's-tail or Reed-mace: see TYPHA. It is perhaps more commonly restricted to large species of the genus *Scirpus* (q.v.), also called Club-rush, and particularly to *S. lacustris*, a common plant in all northern parts of the world, growing about the muddy margins of lakes, and ponds, with a creeping root and round stems varying from 2 to 8 ft. in height, which are almost leafless, and bear their flowers in compound umbels of small brown spikelets on their side. The root is astringent and diuretic, and was formerly employed in medicine; but the stems are the most useful part of the plant, being used for making chair-bottoms, mats, etc.; also by coopers for filling up

spaces between the seams of casks, to which purpose their spongy nature particularly adapts them; and frequently for thatching cottages.

BULTHAUPT, Heinrich Alfred, *hīn'rich âl-frĕd bûlt' howpt*, German poet and dramatist: b. Bremen, 1849, Oct. 26. On quitting the university he was for a while a private tutor; then traveled in the East, Greece, and in Italy. He was a lawyer in his native town for some years, and in 1879 became custodian of the city library. Of his dramatic compositions the list is very long, comprising tragedies, *Saul; A Corsican Tragedy;* plays dealing with the questions of the time, *The Workman;* comedies, comic operas, etc. He has also written *Dramaturgy of the Theater; Dramaturgie der Klassiker*, a work of exceeding value; and *Dramaturgie des Schauspiels;* also *Dramaturgy of the Opera* (2 vols.).

BULTI, *bŭl'tē*, or Lit'tle Tib'et: territory on the Upper Indus beyond the Himalaya, a sort of debatable land between India and Tatary. It is immediately n. of the Vale of Cashmere, with which it is politically connected by conquest. It occupies about 8,000 sq. m.; in n. lat. between 30° 30′ and 36°, and in e. long. between 75° and 77°. With an average elevation of about 7,000 ft. above the sea, B. is surrounded by mountains of nearly the same height above its own level. Hence the temperature is such that only snow falls in what ought to be the rainy season, though in summer the thermometer ranges at noon from 70° to 90° f. European fruits are said to be plentiful. The inhabitants are of the Mongolian race, and chiefly Mohammedans. Among the animals are the sha, the large-horned goat, the sheep, the musk-deer, and the ibis. The only town of consequence is the capital Iskardoh, which sometimes gives its name to the whole province.

BULUBGURH, *bŭl-ŭb-gŭr'*, or Ballamgarh: town of India, principal place of jaghire of the same name, called also Furreedabad. It is on the route from Delhi, in a pleasant, well-cultivated country. The town is not large, and is very crowded, surrounded by a high brick wall, with mud bastions and a deep ditch.

The jaghire of Bulubgurh has an area of 190 sq. m. The British have never interfered with the civil or criminal affairs of the jaghire, except when their interference was requested, during the minority of the present rajah; but the rajah of B. derives his rights from the British government. The revenue of the state is estimated at 160,000 rupees. The rajah maintains a small force of 100 cavalry and 350 infantry. Pop. of jaghire, supposed abt. 57,000.

BULWARK, n. *bûl'werk* [Dut. *bolwerck;* Ger. *bollwerk*, a fortification, a fortified wall: F. *boulevart*, the ramparts of a town, a broad street at Paris (boulevard) surrounding what was once the city, and occupying

the site of its ancient ramparts: It. *baluarte;* Icel. *bolr,* the bole or trunk of a tree]: a rampart; a fortification; any means of defense or protection, originally made of the boles or trunks of trees; the railboards of a ship, forming a fence or wall around the upper deck; security or defense: V. to fortify with a rampart; to protect.

BULWER, *bûl'wĕr,* Sir HENRY LYTTON, G.C.B., The Right Hon: 1801, Feb. 13—1872, May 23; elder bro. of Lord Lytton: diplomatist and author. He entered the diplomatic service 1827, and was attached successively to the British embassy at Berlin, Brussels, and the Hague. In 1830, he entered parliament, and during the following seven years he represented, in order, the constituencies of Wilton, Coventry, and Marylebone. In 1837, he became sec. of embassy at Constantinople, where he negotiated and concluded a treaty which is the foundation of the present British commercial system in the East. In 1843, he was made minister plenipotentiary to the court of Madrid, and concluded the peace between Spain and Morocco in the following year. While in Spain his firmness and candor were a great convenience to Narvaez, the Spanish soldier-diplomatist of that day, who, pretending to have discovered the complicity of the British plenipotentiary in certain plots against the Spanish government, ordered him to leave Madrid. Both parties in the house of commons approved the whole course of Bulwer's conduct at Madrid, and her majesty awarded to him the highest decorations of the Order of the Bath. He afterward proceeded to Washington, where he evinced equal art in conciliating the temper of the people, and maintaining the interests of his own country. In 1852, he was sent to Tuscany as envoy extraordinary; and in 1856 was nominated by Lord Palmerston commissioner at Bucharest for investigating the state of the Danubian Principalities. As British commissioner he called forth from every minister and from every government concerned the warmest expressions of approval, and all concurred in recommending him for the post of ambassador to the Ottoman Porte, on the return of Lord Stratford de Redcliffe, in the spring of 1858. Sir Henry was raised to the peerage 1871, as Lord Dalling and Bulwer. He died at Naples. He wrote Lives of Palmerston and Byron; *Historical Characters; An Autumn in Greece; France, Social, Literary, and Political;* etc.

BULWER-CLAYTON TREATY, a treaty negotiated at Washington, D. C., in 1850, April, by John M. Clayton, secretary of state under President Taylor, and Sir Henry Bulwer, British minister to the United States. It provided that neither the United States nor Great Britain should attempt to control a proposed canal across Nicaragua. The treaty provided further for the

neutrality of the canal, and it guaranteed encouragement to all lines of interoceanic communication. The terms of the treaty were afterward much disputed. In 1882 the United States government intimated to Great Britain that the canal having become impracticable because of reasons for which Great Britain alone was responsible, the United States considered the treaty as no longer binding, but Great Britain continued to hold it as in force. In 1899, March 3, Congress passed a bill providing for the construction of a canal on the Nicaragua route, which also authorized the President to open negotiations with Great Britain for the abrogation of the Bulwer-Clayton Treaty, and under the last clause a convention between the two countries, abrogating the portions of the treaty that were deemed to be against the interests of the United States was signed in Washington, 1900, Feb. 5.

BULWER LYTTON, Sir EDWARD: see LYTTON.

BULYEA, *bûl'yā*, GEORGE HEDLEY VICARS, Canadian statesman: b. Gagetown, N. B., 1859, Feb. 17. He was educated at the grammar school, Queen, N. B., and was graduated from the Univ. of New Brunswick in 1878; was principal of Sudbury Grammar School 1878–82; and went to Winnipeg in the latter year and to Qu' appellee in 1883, there engaging in business. In 1898 he became territorial commissioner in Yukon Territory; in 1891 was defeated as candidate for the territorial assembly, but was elected in 1894, again on taking seat in first executive council in 1896, and subsequently in 1898 and 1902. He is provincial secretary and commissioner of public works in the Northwest Territories.

BUM, v. *bŭm* [Dut. *bommen*, to beat a drum; *bommele*, a bumble bee: mid. L. *bombĭlārĕ*, to make a humming noise—from L. *bombus;* Gr. *bombos*, a humming buzzing noise]: to make a humming or whirring noise. BUMBLE-BEE, n. *bŭm'bl*, or HUMBLE-BEE, *hŭm'bl*, a large bee, so called from the noise it makes—contracted into *bumbee.*

BUM, n. *bŭm* [Fris. *bôm*, ground, bottom: Icel. *bottn;* AS. *botm*, bottom: Gael. *bun*, bottom or foundation (see BUM 1)]: the buttocks; the posterior; the part forming the seat.

BUM, n. *bŭm*, BUMMER [Colloq. U.S.]: a drunken loafer; a debauch.

BUM-BAILIFF, n. *bŭm-bāl'ĭf* [Eng.]: an under-bailiff employed to dun and arrest for debt.

BUMBLE, n. *bŭm'bl* [from a character in Dickens's *Oliver Twist* (see BUM 1)]: an officious overbearing parish officer; a beadle. BUMBLEDOM, n. *bŭm'bl-dŭm*, the officious arrogance of a parish officer; conceited and overbearing conduct of officials.

BUMBLE-BEE: see under BUM 1.

BUMBOAT, n. *bŭm'bōt* [Dut. *bum boot*, a very wide fishing-boat: Fris. *bom* ground, a floor: Dut. *boom*, a beam (see BUM 2)]: a very wide boat used by fishers in s. Holland; a boat employed to carry provisions and other articles from harbors and ports to vessels at some distance from shore. Boats of this latter kind belong to a class of petty traders, who in England are usually women. The boats are a sort of floating shops, with various articles of food, of clothing, and a variety of odds and ends. The less respectable of the B. traders try to smuggle spirits on board. Among the class of B. people generally, there is no little acuteness and enterprise. They learn all particulars about ships going and coming, and will even write to distant ports to secure a vessel's patronage. In come Chinese waters, and from Malta and some other places in the Mediterranean, the bumboats haunt vessels on short cruises, in hope of a little trade.

BUM'KIN, or BOOM'KIN (diminutive of *boom*): on shipboard, a short boom which projects over each bow of the ship to aid in extending the lower edge or clew of the foresail to windward—in nautical phrase, 'to board the fore tack to.' In a boat, the Bumkin is a small outrigger over the stern, used for extending the mizzen.

BUMMALOTI, *bŭm-ma-lō'tē (Saurus ophiodon)*: marine fish of the family *Scopelidæ* or *Sauridæ*, often regarded as a subdivision of the great family *Salmonidæ*. It is a native of the coasts of India, particularly of Bombay and Malabar, whence it is exported in large quantities, salted and dried, to other parts of India, being highly esteemed for its rich flavor, and often used as a relish. In commerce it is known not only by the name Bummaloti, but by the singular appellation of *Bombay Duck*. It is a fish of elongated form, with large fins and a very large mouth, the gape of which extends far behind the eyes, and which is furnished with a great number of long, slender teeth, barbed at the points. It is extremely voracious.

BUMMAREES, n. plu. *bŭm'mă-rēz'* [*F. bonne marée*, good fresh fish]: middlemen or fish-jobbers in Billingsgate market, who purchase large quanties of fish from the wholesale men, and then dispose of them in quantities to suit the requirements of the small dealers.

BUMP, n. *bŭmp* [Low Ger. *bums*, imitating the sound of a blow: Gael. *beum*, a stroke: W. *pwmpio*, to thump, to bang: *pwmp*, a round mass: F. *pompette*, a pimple on the skin]: a swelling; a protuberance; a thump: V. to make a resounding or booming noise; to strike against; to thump. BUMP'ING, *imp.* BUMPED, pp. *bŭmpt.* BUMPER, n. *bŭm'per* [from *bombard*, a great gun, a large drinking-vessel]: a cup or glass swelled or filled with liquor till it is ready to flow over the brim. *Note.*—BUMPER is said to be derived from F.

au bon père, 'to the good father'—the form of words used in drinking the pope's health: another suggested derivation is Gael. *bun*, the bottom and *barr*, the top—that is, full from bottom to top. BUMPER-HOUSE, a place of public amusement full in every corner, or from bottom to top.

BUMPIN, n. *bŭm'kin* [a dim. of Ger. *baum;* Dut. *boom*, a beam, a log, and *kin*, little—connected with BUMP]: an awkward country fellow; a rustic; a stupid peasant. BUMPKINLY, ad. *-lĭ*.

BUMPTIOUS, a. *bŭm'shŭs* [probably formed from Eng. *bump*, as *bumping* against, or striking everything in the way]: noisily self-asserting; quarrelsome and vain-glorious; given to take offense. *Note.*—Also, said to be a mere corruption of *presumptuous*.

BUMP'US, *bŭmp'ŭs*, HERMAN CAREY, American educator: b. Buckfield, Maine, 1862, May 5. He was graduated from Brown University in 1884, was professor of biology at Olivet College, Mich, 1886–9; professor of zoology in Clark University, Worcester, Mass., 1890–1; and professor of comparative anatomy in Brown University from 1892–1901. From 1898–1901 he was director of the biological laboratory of the United States Fish Commission at Wood's Hole, Mass. Since 1902 he has been director of the American Museum of Natural History, New York. He is the author of *A Laboratory Course in Invertebrate Zoology* (1893).

BUN, or BUNN, n. *bŭn* [F. *bigne*, a knob rising after a knock; *bignet*, a little round loaf: Gael. *bonnach;* Scot. *bannock*, a little cake]: a small sweet cake. HOT-CROSS-BUN, a small circular cake, impressed with a cross, largely eaten on Good Friday. *Note.*—Probably a Christian accommodation of an ancient heathen practice in presenting the *boun* or sacred cake, so named as impressed with the figure of an ox [Gr. *bous*, an ox].

BUNCE, FRANCIS MARVIN, American naval officer: b. Hartford, Conn., 1836, Dec. 25; d. there, 1901, Oct. 19. He entered the naval service in 1851, and was graduated from the naval academy in 1857. In 1862 as executive officer of the Penobscot he took part in the engagement with the rebel batteries at Yorktown, Va. Assigned to temporary duty with the army, he had charge of the disembarkation of the heavy artillery and mortars for use in the investment of Yorktown by Gen. McClellan, 1862, April. He commanded a successful expedition up Little river, between North and South Carolina, destroying several schooners and large quantities of cotton, turpentine, and resin, together with extensive salt works. With the monitor Patapsco in 1863 he took part in all the actions in which she was engaged during the siege of Charleston, and was wounded by the premature explosion of a cartridge. Later he was chief of scouts on the staff of Admiral Dahlgren. On 1865,

Sept. 5, he was placed in command of the monitor Monadnock, and took that vessel from Philadelphia to San Francisco, the first extended sea voyage ever made by a monitor. On 1895, March 1, he was selected to command the North Atlantic squadron with the rank of active rear-admiral. On 1897, May 1, he went to the Brooklyn navy yard and there superintended the conversion of many fast ships and yachts for war service. It is said that the government's policy of furnishing the navy with abundant ammunition for target practice and giving prizes for the best shots, a policy which produced such admirable results in the Spanish-American war, was due to the efforts of Admiral Bunce. He was commissioned rear-admiral 1898, Feb. 6, and retired from active service 1898, Dec. 25.

BUNCE, Oliver Bell, American author: b. New York, 1828, Feb. 8; d. there, 1890, May 15. After spending several years as clerk in a stationery store, and bookseller and publisher on his own account, he became manager of the publishing house of James G. Gregory, which he conducted very successfully for many years. It was at his instigation that the fine edition of Cooper's works, with steel and wood engravings by F. O. C. Darley, was planned and published. For a short time he was a reader for Harper & Bros., but in 1869 he formed a connection with D. Appleton & Company, that ended only with his death. He edited *Appleton's Journal*, and largely planned and carried through for the firm some of their most famous illustrated publications, such as *Picturesque America*, *Picturesque Europe*, *Picturesque Palestine*. In addition to office business his literary aptitudes and ambitions kept him at work in spite of chronic invalidism. He wrote among other works, *Romance of the Revolution* (1852); *A Bachelor's Story* (1859); *Life Before Him* (1860); *Bachelor Bluff, His Opinions, etc.* (1881); *Don't: A Manual of Mistakes and Improprieties* (1883), of which over 100,000 copies have been sold; *My House: An Ideal* (1884), a graphic study of a country home; and *The Adventures of Timias Terrystone: a Novel* (1885). As a very young man he wrote three plays which were accepted and produced on the stage with success: *Fate, or the Propheey*, a tragedy; *Love in '76*, a comedy; *Marco Bozzaris*, an heroic tragedy. The second of these was played by Laura Keene, the other two by James W. Wallack.

BUNCH, n. *bŭnsh* [Icel. *banga*, to beat; *bunki*, a heap: Dan. *bundt;* Sw. *bunt*, a bunch]: a heap or quantity gathered together; a lump or knot; a cluster; a protuberance; a number of things growing together or tied together; a miner's term for an irregular lump of ore: V. to swell out in roundness; to form or tie in a lot or bunch. Bunch'ing, imp. Bunched, pp. *bŭnsht.*

BUNCHY, a. *bŭnsh'ĭ*, growing in bunches; having tufts. BUNCH'INESS, n.

BUNCO, n. *bŭng'kō* [U. S.]: a swindling game practiced on strangers. V. to swindle.

BUNCOMBE, n. *bŭng'kŭm*, sometimes written BUNKUM [from *Buncombe*, a county in N. C., whose representative in congress is said to have declared, after making a showy and flaming speech, that his speech was only 'for Buncombe']: speech-making for mere show; mere claptrap; fervid oratorical display with no basis of principle.

BUND, n. *bônd* [Ger.]: a confederation.

BUND, n. *bŭnd* [Anglo-Ind.]: an embankment.

BUNDELCUND, *bŭn-dl-kŭnd'*, or BANDALKHAND: territory of Hindustan, between Gwalior on the w., and the Jumna, which separates it from the Doab, on the n. e. The area formerly known as Bundelcund included four districts belonging to the British N. W. Provinces (Banda, Jalun, Jhansi, and Hamirpur). Now Bundelcund is officially used only for the 'Bandalkhand Agency,' a subdivision of the Central India Agency, and in this sense is applied to a group of nine native states, and twenty-five petty jaghires under native princes; area of the agency 10,240 sq. m. Studded, as Bundelcund is, with isolated rocks rising precipitously from its surface—each of them a nucleus, as it were, of independence—it has been politically much subdivided. Pop. of agency (1891) 2,206,402.

BUNDESRATH, *bûn'dĕs-rât* [Ger. *bund*, federation; *rath*, council]: council of the federation. Specifically, in the existing Ger. empire, the 'Federal Council,' a legislative body consisting of representatives of the several states comprised in the empire. Under the Swiss constitution the Bundesrath ('Federal Council,') is the chief executive body.

BUNDI, or BOONDEE, *bôn'dē:* town of India; n. lat. 25° 26′, e. long. 75° 43′; 190 m. s.w. from Agra; capital of the small state of Bundi. It is in a valley nearly surrounded by rocky hills. The palace of the rajah is on the slope of the hill above the town, and is of great magnificence and beauty, consisting of a number of parts built at different dates, but harmonizing extremely well. The town contains few notable edifices. It has two good bazaars, but it is a place of little commerce. It is celebrated for its iron manufactures.

The raj or state of Bundi comprises 2,291 sq. m. A range of mountains, running n.e. and s.w., divides two nearly equal level tracts—that on the s.e. extending to the river Chumbul, and that on the n.w. to the base of the mountains toward Ajmere. The climate is said to be unhealthful. Although the rajah and dominant portion of the inhabitants are Rajpoots, the greater part of the population, particularly in the mountains,

are Meenas, supposed an aboriginal race, who are indefatigable freebooters. The military force of the state, including the troops of the feudal chiefs and the police force, is 6,170 men. The revenue is about £50,000. Pop. about 275,000.

BUNDLE, n. *bŭn'dl* [Dut. *bondel*, something bound up together: Ger. *bündel*, a dim. of *bund*, a bunch, a bundle; Dan. *bundt;* Sw. *bunt*, a bundle]: a number of things put together and tied: V. to tie up together. BUN'DLING, imp. BUNDLED, pp. *bŭn'dld.* BUNDLE-PILLAR, a column or pier with others of small dimensions attached to it. To BUNDLE OFF, in *familiar language*, to send off unceremoniously. BUNDLE OFF! get away with all you have.

BUNDOBUST, or BANDOBAST, n. *bŭn'dō-bŭst* [Pers.]: in *India*, an agreement; a bargain.

BUNG, n. *bŭng* [old Ger. *bunge*, a drum: Dut. and F. *bonde*, a *bung:* W. *bwng*, a bung-hole]: a large round cork or wooden stopper for the hole in a cask: V. to stop up the opening in a cask with a bung. BUNG'ING, imp. BUNGED, pp. *bŭngd.* BUNG-HOLE, n. the hole in a cask by which it is filled or emptied.

BUNGALOW, n. *bŭng'gă-lō* [native name, *bangla*]: in *India*, a country house usually of one floor or flat only; a caravansary for the use of travellers. Bungalows which form the residence of Europeans are of all sizes and styles, according to the taste and wealth of the owner. Usually they consist of only a ground-floor, and are invariably surrounded with a veranda, the roof of which affords a shelter from the sun. In the chief cities of Calcutta, Madras, and Bombay some of the bungalows are really palatial residences, while in the mofussil they are of more moderate pretensions. In general they are provided with exterior offices, or buildings to accommodate the large retinue of domestics common in Indian life. Besides these private bungalows, there are military bungalows on a large scale for accommodating soldiers in cantonments; likewise public bungalows, maintained by government for the accommodation of travellers, and in which are blended the characters of an English roadside inn and an eastern caravansary. These bungalows, though they vary greatly in actual comfort, all are on the same plan. They are quadrangular in shape, one story high, with high-peaked roofs, thatched or tiled, projecting so as to form porticoes and verandas. The bungalow is divided into 'suits' of two, three, or four rooms, provided with bedsteads, tables, and chairs; windows of glass, and framed glass-doors. Off each room is a bath-room, and earthen jars of cool water. Travellers are expected to carry their servants, cooking-apparatus, wine, beer, bedding, etc., with them; but the khitmutgar of the better class of bungalows supplies tableware, condiments, and even sometimes food and liquors, and he is usually

skilled in cooking. Government charges one rupee, or about half a dollar a day, to each traveller for the use of the bungalow. A book is kept, in which travellers enter their names, the time of their arrival and departure, with the amount paid, and any remarks regarding the state of the bungalow and its attendance he may think proper. Natives seldom stop in these public bungalows, for though legally open to all, they are almost exclusively resorted to by Europeans; and natives even of good condition are fain to seek 'the squalid desolation of a tottering caravanserai,' or village 'dhurrumsala.' At every travellers' bungalow is stationed a government peon, who acts as watchman, and is bound to assist travellers' servants in procuring supplies of fuel and food in the nearest village. The distance between each bungalow on a trunk-road is generally about 12 or 15 m.—an Indian day's journey.

BUN'GAY: market town of the county of Suffolk, England, 30 m. n.n.e. from Ipswich. It occupies the sides and summit of a gently-rising hill, on the right bank of the Waveney, and is well-built, with wide streets, the principal ones diverging from the market-place. The town grew around Bungay Castle, supposed to have been erected by the Bigods, Earls of Norfolk, and of whose walls some ruins remain. The ruins of a Benedictine nunnery also are to be seen in the town. The Church of the Holy Trinity is an edifice with a round tower, supposed to date from the time of Edward the Confessor. There are numerous places of worship, belonging to different denominations, and schools, charitable institutions, assembly rooms, etc. What was formerly the theatre is now used as a corn-hall. Bungay carries on considerable trade by the river Waveney in corn, malt, flour, coals, and lime. There is also an extensive printing office and a stereotype foundry. Adjoining the town is a very spacious common.

BUNGERT, August, German composer: b. Mülheim, Prussia, 1846, March 14. He studied under Kufferath at Mülheim, at Cologne, and Paris. He held a position as musical director at Kreuznach, then went to Berlin, where he continued his studies under Kiel, and later moved to Genoa. His compositions include an opera cycle, *The Homeric World*, consisting of two main parts, *The Iliad*, and *The Odyssey; Tasso; The Students of Salamanca*, a comic opera; *On the Wartburg;* and a number of songs. The songs are considered his most successful productions.

BUNGLE, n. *bŭng'gl* [Icel. *bö'ngan*, a rude performance: Dan. *bankc;* Icel. *banga*, to strike, as nailing on a patch: Gael. *bunach*, clumsy]: anything ill done; a botch; an affair mismanaged: V. to do anything clumsily; to mismanage an affair; to botch. Bungling, imp. *bŭng'glĭng*. Bungled, pp. *bŭng'gld:* Adj. awkwardly done; executed badly. Bun'glingly, ad. *-lĭ*. Bun'-

GLER, n. *-glēr*, a bad or clumsy workman; one who does a thing ill.

BU'NIAS: genus of plants of the nat. ord. *Cruciferæ*, distinguished by *incumbent* linear spirally-twisted cotyledons (q.v.), and a nut-like silicule (or round pod) with 2–4 cells. Only a few species are known, natives of the Levant. One of these, *Bunias Orientalis*, is cultivated in some countries—particularly in France—as a field-crop, for its leaves, which are food for cattle. It was introduced into Britain more than 100 years since, but its cultivation has never become general, the amount of herbage which it yields being comparatively small. It is sometimes called HILL MUSTARD.

BUNION, n. *bŭn'yŭn* [Dan. *bunke*, a heap: Icel. *bunga*, an elevation: Gael. *bunian*, a little root or stump—from *bun*, a root or stump]: enlarged bursa, or synovial sac, occurring in the anterior part of the foot, especially over the metatarsal joint of the first or the fifth toe (most frequently at the junction of the great toe with its metatarsal bone; see FOOT), and accompanied by more or less distortion of the joint. In the great majority of cases, bunions are directly produced by the pressure of badly-fitting boots; and if the boots are of patent leather, or any material which stops the excreting action of the skin, this may be regarded as an indirect cause. A bunion begins as a painful and tender spot over one of the metatarso-phalangeal joints; the part gradually enlarges, and there are indications of an effusion into a natural bursa or a newly-formed sac. The progress of the affection may stop here, the bursa remaining, and serving to protect the subjacent parts from pressure; but far more frequently it undergoes repeated attacks of inflammation, causing its enlargement or suppuration of the contents of the cyst ensues. The last accident may be followed either by obliteration of the cyst, and cure, or by a troublesome form of ulcer.

It is in its early stage that treatment may be looked to for a cure; subsequently, palliation is all that can be expected. The tender spot that precedes the enlargement should be covered by night with wet lint and oiled silk, while by day a boot or shoe exerting no pressure on the part should be worn. If the part is very tender it may be covered during the day with soap-plaster spread on wash-leather. As soon as a cyst can be detected the part should be occasionally treated with strong tincture of iodine, with the view of promoting absorption. An ointment of biniodide of mercury (10 grains to an ounce of lard) may prove serviceable when the B. is not inflamed, especially when there is a considerable effusion of fluid within it. It should not be applied so constantly as to blister the skin. When, from any cause, inflammation takes place in the sac, water-dressing or a poultice should be applied, and as

soon as there are definite signs of suppuration, a free incision should be made, which at once relieves the pain, and is often followed by a complete cure.

The ulcers resulting from the bursting of a bunion are very difficult to heal, especially in old persons whose circulation is weak. Stimulating local applications, such as ointment of resin, should be applied.

BUNK, n. *bŭngk:* a sleeping-place.

BUNKER, n. *bŭng'kėr* [Sw. *bunke*, a wooden vessel: Icel. *bunki*, a heap]: a large wooden box for containing coals; a bin. BUNK, n. *bŭngk*, a large wooden case serving for a seat during the day, and for a bed at night.

BUNKER HILL, BATTLE OF: first considerable battle of the Amer. revolution, 1775, June 17; the previous blood-shedding at Lexington (q.v.) and Concord (q.v.), in Apr. of the same year, having been more of the character of skirmishes. Aroused by those events of Apr., the patriots were gathering at various points, particularly in the vicinity of Boston, to the number of 20,000, forming a line from Cambridge to Roxbury, under command of Gen. Artemas Ward. George Washington, appointed commander-in-chief by congress two days before the battle, had not had time to arrive at the scene of action. The memorable men, Gridley Pomeroy, Prescott, Putnam, and Stark, were on the ground. It was learned that the royalist army, under Gen. Gage, intended to occupy Bunker Hill on the 18th. The patriots resolved to anticipate the movement, and 1,000 men, under Col. William Prescott, marched on the night of June 16 to fortify Bunker Hill; but, on further consideration, the plan was modified and the earth-works were formed on Breed's Hill, where the monument now stands. In the morning, the British ships and the guns on Copp's Hill, in Boston, began a cannonade, and the British troops were set in motion for assault on the position. A force of 4,000, under Gens. Howe and Pigot, landed e. of Breed's Hill. Meanwhile, Amer. re-enforcements arrived, under Gens. Warren and Pomeroy, increasing the patriot force to probably a total of 1,500. At 2 P.M. began the British advance, in the direction of the Mystic river, for a rear attack; but this had been foreseen, and a breast-work erected near Bunker Hill, and another begun on that hill. Forces were placed w. and s.w. of the positions. The stratagem of the enemy was abandoned, and Gen. Howe made a direct assault, simultaneously with a cannonade from the ships and Copp's Hill, he commanding the right wing, and Gen. Pigot the left. Gen. Prescott, in command of the patriots, ordered them to hold their fire until they could see the whites of the enemy's eyes. Not a shot answered the fire of the British until they were near the redoubt, when the rapid volleys of the patriots broke the enemy's ranks and sent

him flying, until rallied and re-enforced with artillery for a second attack, under cover of smoke from the burning houses of Charlestown, set on fire by hot shot from Copp's Hill. This movement was repulsed in the same way; but a third attack was successful, the patriots having nearly exhausted their ammunition and being forced from their lines into the redoubt, from which, after a fight with clubbed muskets, they retired across Charlestown Neck. Gen. Warren was shot dead in the beginning of the retreat. The British loss was estimated at 1,050, including killed and wounded; the American, 450.—The obelisk of granite on Breed's Hill, now known as Bunker Hill, was begun 1825, when Gen. Lafayette laid the corner-stone; and was dedicated 1843. It is 221 ft. high, with an interior winding stairway; and the summit affords a fine panorama of the vicinity. On both the above occasions, Daniel Webster was the orator.

BUNNY, n. *bŭn'nĭ* [Gael. *bunag*, a stumpy tail; *bunan*, a little stump or root]: a familiar name for a rabbit; a small swelling: a kind of drain.

BUNODES: see ACTINIA.

BUNODONT, a. *būn'ō-dŏnt* [Gr. *bounos*, a mound, a heap; *odous* or *od'onta*, a tooth]: having teeth with tuberculated crowns, as the pigs.

BUNSEN, *bûn'sn*, CHRISTIAN KARL JOSIAS, Baron: 1791, Aug. 25—1860, Nov. 28; b. Korback, in the principality of Waldeck, Germany: distinguished scholar and statesman. He studied philology at Göttingen (1809–13) under Heyne. He had been appointed teacher in the Gymnasium of Göttingen 1811, but quitted the position 1813; and in pursuance of a course of study of Old and Middle High German, begun in company with Lachmann, and to extend his knowledge of his Germanic tongues, he went to Holland, and afterward to Copenhagen, where he learned Icelandic from Fin Magnussen. The historiacl works of Niebuhr and his character as a politician had filled Bunsen with enthusiasm, and he spent some months of 1815 in Berlin, to become personally acquainted with the historian. In 1816, he went to Paris, and studied Persian and Arabic under Sylvestre de Sacy, and in the same year to Rome, where he married. Niebuhr, then Prussian ambassador, took the greatest interest in the scientific pursuits of Bunsen, and procured (1818) his appointment as sec. to the embassy. The residence of the king of Prussia, Friedrich Wilhelm III., in Rome in 1822, had a decided influence on his subsequent career. In the course of a conversation in which Bunsen had disagreed with the king, the latter asked his views on the Prussian ritual *(Agende)* and hymn-book question, then much agitated. Though these views were very different from what the king had been accustomed to hear, he took them in good part, and with expression of his personal regard, requested Bun-

sen to continue in the state service. On Niebuhr's departure from Rome (1824), Bunsen conducted the embassy provisionally for a time, and was then appointed resident minister (1827). Living in intimate intercourse with Niebuhr, Bunsen had employed the time in deepening his investigation into the philosophy of language and religion; and had made, on the one hand the philosophy of Plato and the constitutions of antiquity, on the other biblical inquiries, church history, and liturgies —objects of special attention. Though not within the scope of the great plan of his life, he contributed largely to the *Beschreibung der Stadt Rom* (Description of Rome), 3 vols. (Stutt. 1830–43); the greater part of the topographical communications on ancient Rome, and all the investigations into the early history of Christian Rome, are by him.—The first visit of Champollion to Rome formed an epoch in Bunsen's antiquarian studies. He was a zealous hearer of Champollion himself, and also encouraged Lepsius (q.v.) to the study of hieroglyphics. The Archæological Institute, established 1829, found in Bunsen its most active supporter. When he founded the Protestant hospital on the Tarpeian Rock (1835), he also built, adjoining his own house, a place of meeting for the Institute; and labored earnestly for the cause of Protestantism. The king of Prussia had often asked his advice concerning the ritual, but had not adopted it. Bunsen then, with the chaplain, introduced (1825) into the chapel of the embassy at Rome a liturgy modelled after his own views, and sent a report (1828) to the king of the result. The king had this liturgy printed, and wrote the preface with his own hand. This work never came into the hands of the trade; but the most of it was embodied in the *Allgemeine evang. Gesang- und Gebetbuch*, printed (1846) without the author's name, in the Rauhe Haus, Hamburg, which may be considered as the second edition of the *Versuch eines allgemeinen evang. Gesang- und Gebetbuchs* (Attempt at a General Evangelical Hymn and Prayer Book), Hamb. 1833.

In 1841, he was sent on a special mission to London, to negotiate the erection of an Anglo-Prussian bishopric in Jerusalem, and was shortly afterward appointed ambassador at the English court. It is understood that, on occasion of a visit to Berlin 1844, he was asked to write down his views on the question of granting a constitution to Prussia; and that in consequence he presented a series of memorials representing the urgency for a deliberative assembly, and also made a complete plan of a constitution closely resembling the English. In the Schleswig-Holstein question Bunsen strongly advocated the German view in opposition to Denmark, and protested against the London protocol of 1850. But in the midst of all his political duties, Bunsen continued unabated his literary and philosophical pursuits, the results of which have from time to time appeared. His

views regarding the part that Prussia should act in the Eastern question not being, it is understood, in accordance with those of his court, he ceased, 1854, to represent Prussia at the court of England, and retired to Heidelberg. Bunsen, as the most philosophical and most reverent of lay-theologians, rendered great services to the cause of enlightened Christianity. His chief works are: *De Jure Atheniensium Hæreditario* (Gött. 1813); *Die Kirche der Zukunft* (The Church of the Future—trans. into English, pub. by Longman), Hamb. 1845; *Ignatius von Antiochen und seine Zeit* (Ignatius of Antioch and his Time), Hamb. 1847; *Die drei echten und die vier unechten Briefe des Ignatius von Antiochien* (The Three Genuine and the Four Spurious Epistles of Ignatius of Antioch), Hamb. 1847; *Ægyptens Stelle in der Weltgeschichte* (Egypt's Place in the World's History—trans. into English by Cottrell), Hamb. 1845—57; *Die Basiliken des Christlichen Roms* (The Basilicas of Christian Rome), 1843; *Hippolytus und seine Zeit* (Hippolytus and his Time), 1851; *Christianity and Mankind*, 1854; *Gott in der Gesehiehte* (God in History), 1857; and the *Bibelwerk*, 9 vols., 1858–69. Bunsen died at Cannes. See *Memoir*, 1868, by his widow, the Baroness Frances B. (1791–1876); and her own *Life and Letters*, by Hare (1878).

BUNSEN BURNER, n. *bûn'sn-* [from Robert Wilhelm *Bunsen*, a German chemist]: a burner and lamp contrived to give out an intense heat by the free admission of air.

BUNT, n. *bŭnt* [Dan. *bundt;* Sw. *bunt*, a bunch, a bundle]: the belly, or protuberance, or bagging part of a sail; a fungoid disease which attacks wheat. BUNTLINES, n. plu. ropes on the bottoms of sails to draw them upward.

BUNT: disease of wheat and other grains, or the parasitic fungus which causes that disease. The name Bunt is supposed, by some, to be a corruption of *burnt*, or at least from the same root, a derivation perhaps suggested by the analogy of *Brand* (q.v.). Bunt is also called *Pepper Brand*, and sometimes *Smut Ball*. It is one of the most common and injurious diseases of wheat, often affecting great part of a crop, though its prevalence has been greatly diminished by care on the part of farmers, and particularly by the selection of clean seed, and the dressing of the seed, before sowing, with some substance, which, without injuring its vitality, destroys that of the spores or granules of the fungus. Even washing with water has a good effect, but greater benefit is derived from dressing with salt, quicklime, chloride of lime, Glauber's salt (sulphate of soda), and quicklime, or blue vitriol (sulphate of copper). Even arsenic and corrosive sublimate are used for this purpose. Bunt is now believed to be propagated by any contact of sound with unsound grain; by

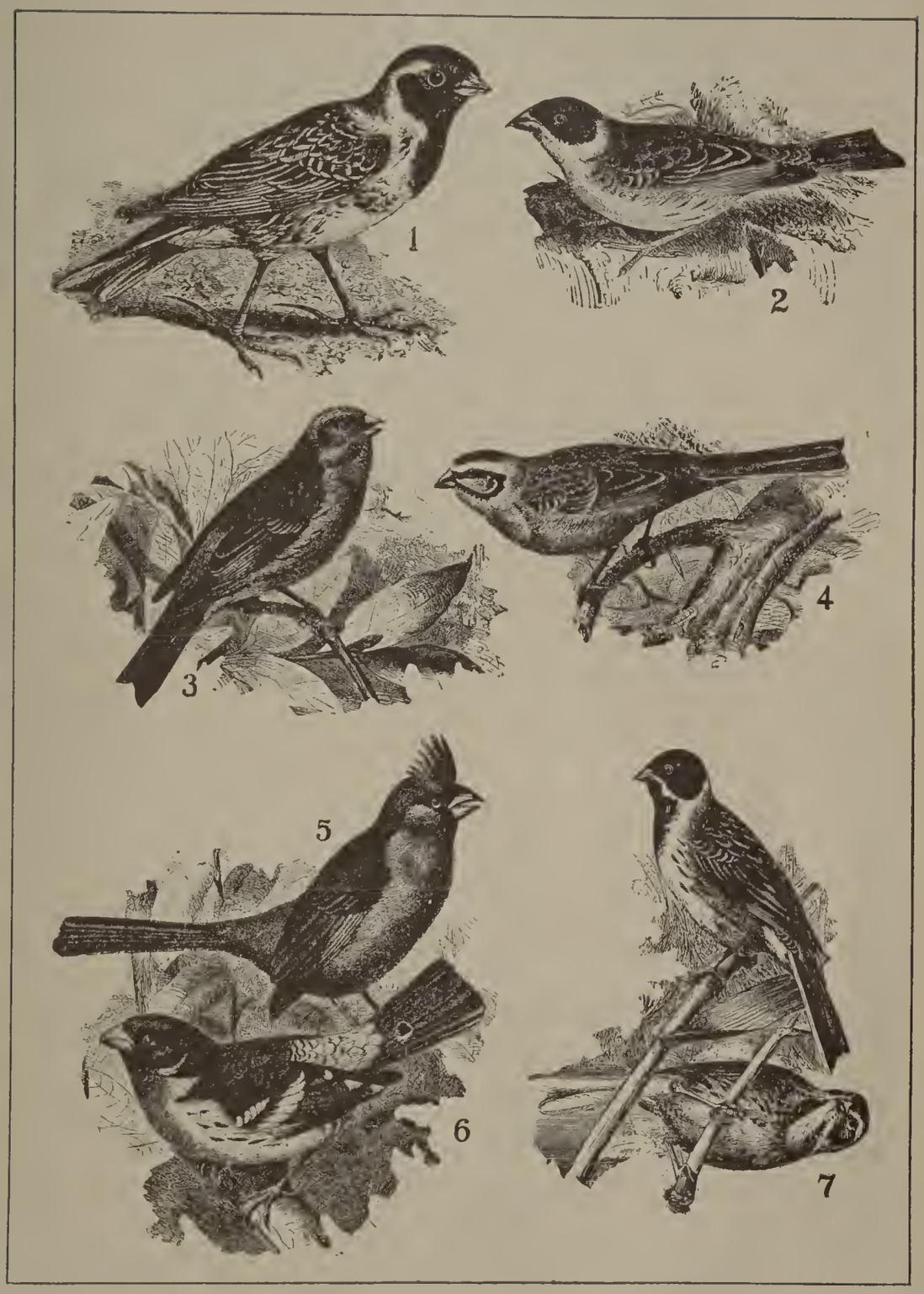
thrashing, which causes the bunt dust to fly about; or by manure in which the straw of infected grain has been mixed. Upon this belief, the means now adopted for its prevention are founded. A considerable mixture of bunt is not supposed to render flour absolutely unwholesome, at least when made into fermented bread, but the bread is of a peculiar flavor, and a very dark color. It is said that such flour is largely used in the manufacture of gingerbread, the treacle disguising both the color and the flavor.

BUNTER SANDSTEIN, *bûn'tėr săn̈d'stīn*, or 'variegated sandstone' [see BUNTING]: the lowest member of the Triassic Period. As the triass is more perfectly developed in Germany than in Britain, the German beds are the typical group. The bunter sandstein consists of various colored sandstones, interstratified with red marls and thin beds of limestone, which occasionally, as in the Harz, are oolitic, but in other places dolomitic. They attain a maximum thickness of 1,500 ft. The English representatives of the bunter sandstein are developed chiefly in Lancashire and Cheshire and consist of red and mottled sandstones with beds of marl, and thick, rather irregular bands of partially consolidated conglomerate called 'pebble beds.' Thirty species of fossil plants have been found in the bunter sandstein near Strasburg, chiefly ferns, cycads, and conifers. But the most remarkable fossils in this formation are the remains of huge batrachians. Originally, only the foot-prints of the animals on the moist sand were observed. From their resemblance to the impressions made by a human hand, the animal producing them was provisionally named *Cheirotherium* (q.v.). The subsequent discovery and examination of the remains of teeth and bones in the same beds, have afforded sufficient materials to enable Owen to reconstruct an animal named by him *Labyrinthodon* (q.v.), which undoubtedly produced the footprints. These remains have been detected in Lancashire and Cheshire, as well as in Germany.

BUN'TINE: thin woolen material: see BUNTING.

BUNTING, n. *bŭn'tĭng* [Ger. *bunt*, variegated: perhaps connected with Scot *buntin*, short and thick: W. *buntin*, the rump]: a thin woolen cloth used for flags, and variously colored; a name for a genus of small birds, as *yellow bunting*, *corn-bunting*, *snow-bunting*. BUN'TER, n. *-tėr*, in *geol.*, the lower Trias or New Red Sandstone; a party-colored sandstone.

BUNT'ING, *(Emberiza)*: genus of birds closely allied to finches and sparrows, and included with them by some ornithologists in the great family *Fringillidæ* (q.v.); but by others made the type of a distinct family, *Emberizidæ*, of which the most marked characteristics are a short, straight, conical bill; a curved form of the gape, produced by a narrowing of the sides of



1. Lapland Longspur Bunting.
2. Chaffinch.
3. Wild Canary.
4. Meadow Bunting.
5. Cardinal.
6. Rose-breasted Grosbeak (male).
7. Reed Bunting (male and female.)

the upper mandible, and a corresponding enlargement of the under one, and a hard rounded knob on the palate or inner surface of the upper mandible. This knob probably aids in crushing the seeds, the principal food of these birds. The species of the bunting family are numerous, and arranged in several genera. The true buntings (forming the restricted genus *Emberiza*) have the hind claw moderately short, curved, and strong, and the palatial knob large and bony. The COMMON B. or CORN B. *(E. miliaria)*—a bird considerably larger than a house-sparrow, brown, with darker streaks on the upper parts, whitish brown, with spots and lines of dark brown on the under parts, and with a slightly forked tail—is frequent, particularly in low cultivated grounds in most parts of Europe, extending also into Asia, living in pairs during spring and summer, but in flocks in winter, and often visiting barn-yards, at that season, with chaffinches and sparrows. It is the largest of the British buntings. It is supposed that the winter flocks of Britain are much increased by migration from more northerly regions. This bunting often passes the night on the ground in stubble-fields, and is taken in the nets employed for catching larks, and brought with them to market. It usually builds its nest on or very near the ground. Its notes are harsh and unmusical.—The REED B., or BLACK-HEADED B. *(E. Shoeniclus)*, is a species common in marshy situations, in Europe; a very pretty little bird, with black head and throat, strikingly contrasted with the white nape and sides of the necks.—The CIRL B. *(E. Cirlus)*, of which the head is olive-green, with black streaks, and with patches of bright lemon-yellow on the cheeks and over the eyes, belongs chiefly to the s. of Europe and the n. of Africa. To this genus belong also the ORTOLAN (q.v.) and the YELLOW-HAMMER (q.v.).—The SNOW B. (q.v.) or SNOW-FLAKE (*E. nivalis* of many authors), has been placed in the new genus *Plectrophanes*. The name bunting has been often vaguely used, and many species have been almost indiscriminately called buntings or finches. The palatal knob affords the best distinctive character. N. America has a number of species of bunting. The BLACK-THROATED B. *(E. Americana)* is extremely plentiful on the prairies of Texas and other s.w. parts of the United States; extending, however, as far as Ohio, and even Massachusetts. In the middle and northern states it occurs only as a summer bird of passage. In its habits it closely resembles the Common Bunting of Europe; but the palatal knob is less hard.

BUNT'ING, JABEZ: 1779–1858, June; b. Manchester, England: Wesleyan minister. At the age of 20, he devoted himself to ministerial work, in which he was very successful. He was elected pres. of the annual conference 1820, '28, '36, '44. In 1834, he was chosen pres. of the theo. institution belonging to the Wesleyan Meth.

body, and he acted as one of the secretaries to the Missionary Soc. of his denomination, for more than 20 years. He was the chief authority in all matters relating to the government and polity of Wesleyan Methodism. On his retirement from official life, 1857, his friends presented him with an annuity of £200, in consideration of his great services.

BUN'YAN, John: 1628–88; b. Elstow, near Bedford, England: one of the most popular religious writers of any age. He was brought up to his father's trade of tinker, and spent his youth in that humble craft. It has generally been taken for granted that his early life was loose and profligate, on the sole ground of his terrible self-accusations in after years, when, from the height of religious fervor and Puritan strictness, he looked back on dancing and bell-ringing as deadly sins. This point is satisfactorily disposed of by Macaulay *(Encycl. Britann.*, art. 'Bunyan'). In his 16th or 17th year he enlisted in the parliamentary army, and in 1645, was present at the siege of Leicester, where he escaped death by the substitution of a comrade in his place as sentry. Nothing further is known of his military career. After leaving the army he married, and soon began to be visited by those terrible compunctions of conscience and fits of doubt, sometimes passing into despair, which with some quieter intervals, made his life, for several years, a journey through that Valley of Humiliation, of which he afterward gave so vivid a picture. Hope and peace came to his soul at last, and in 1655, Bunyan became a member of the Baptist congregation at Bedford. Soon afterward he was chosen its pastor, and for five years ministered with extraordinary diligence and success, his preaching generally attracting great crowds. The act against conventicles, passed on the Restoration, put a stop to his labors; he was convicted and sentenced to perpetual banishment. In the meantime, he was committed to Bedford jail, where he spent the next 12 years of his life; supporting the wants of his wife and children by making tagged laces, and ministering to all posterity by writing the *Pilgrim's Progress*. His library consisted of a Bible and Fox's *Martyrs*. He was at last released (but not by the interposition of a high-church bishop, as was formerly said), and he at once resumed his work as a preacher; itinerating throughout the country. After the issuing of James II.'s declaration for liberty of conscience, he again settled at Bedford, and ministered to the Baptist congregation in Mill-lane, till his death at London, of fever. Bunyan's whole works were published 1736, 2 vols. folio. The most popular of them, after the *Pilgrim's Progress*, are the *Holy War*—another allegory, much less successful—and *Grace Abounding to the Chief of Sinners*, an autobiographical narrative. It is supposed that no other book, except the Bible, has gone through so many

editions, and attained so wide a popularity, in all languages, as the *Pilgrim's Progress*. A fac-simile reprint of the original edition of the *Pilgrim's Progress* was published 1875. A statue of Bunyan stands at Bedford. See Lives by Philip (1839); Froude (1880); and John Brown (1886).

BUNZLAU, *bûntz'low:* town of Prussia, in Silesia, on the Bober, 25 m. w.n.w. of Liegnitz. B. has manufactures of woolens, linens, hosiery, tobacco, and earthenware, and a trade in grain. An obelisk to the Russian general, Kutusow, who died here in 1813, adorns the market-place. Pop. 14,000.

BUNZ'LAU, JUNG, or NEUE *(New Bunzlau):* town of Bohemia, on the left bank of the Iser, about 32 m. n.e. of Prague. Bunzlau is well built of stone, has an old castle, and manufactures of cotton, woolen, soap, leather, etc. It is said to owe its origin to King Boleslaf, 973; and the fort built by him is still shown. Its Bohemian name is *Mlada Boleslaw.* Pop. 11,532.

BUOL-SCHAUENSTEIN, *bô'ol-show'ĕn-stīn,* KARL FERDINAND, Count: 1797, May 17—1865, Oct. 28; Austrian statesman. After filling subordinate diplomatic posts, he became ambassador at Carlsruhe 1828, afterward at Stuttgart (1838) and at Turin (1844). Leaving Turin on the outbreak of the war, 1848, he went as ambassador to St. Petersburg, and it fell to him to uphold the interest and dignity of his country, on occasion of the aid given by Russia in the Hungarian war. A not less difficult task was assigned him when, 1851, he was sent to represent Austria in London; his address and conciliatory bearing contributed not a little to bring about a more friendly feeling between the two governments. On Schwarzenberg's death Buol-Schauenstein was recalled to Vienna, and became foreign minister. In this position, he carried out the new politics of Austria no less firmly and successfully, though more moderately and quietly than his predecessor. In the negotiations during and after the termination of the Crimean war, he showed himself a skilful and able statesman. After defending with zeal and ingenuity, in diplomatic notes and circulars, the position which Austria had taken with reference to Sardinia, he suddenly, on the actual commencement of the Italian campaign of 1859, resigned his place, which was immediately filled by Count Rechberg. Failing health was the cause officially assigned for the step, but the general belief was, that it indicated a triumph of the war-party in the council of Francis Joseph.

BUONAROTTI, MICHAEL ANGELO: see MICHAEL ANGELO.

BUOY, n. *bwôĭ* [Dut. *boei;* Sp. *boya,* the float of an anchor or of a net: Sp. *boyar,* to float: F. *bouée,* a buoy —from OF. *boye*—from mid L. *boia,* a fetter, a clog]: an empty cask, or a small structure of wood, made for

floating on the water, to point out shallows or rocks, etc.: V. to keep afloat; to bear up; to support; to sustain; to place buoys; to float. BUOY'ING, imp. BUOYED, pp. *bwôĭd*. BUOYANCY, n. *bwôĭ'ăn-sĭ*, the quality of floating on water or in air; lightness. BUOY'ANT, a. floating; light; that cannot sink. BUOY'ANTLY, ad. *-lĭ*. BUOY'ANTNESS, n. LIFE-BUOYS, articles to be thrown into the water when any person falls into such as the sea, to keep him afloat; a float.

BUOY: a floating body, intended as a mark for the guidance of mariners. It is made of wool or metal, and is mostly hollow. Buoys are usually moored by chains to the bed of the river or channel. They are of various shapes and sizes, and are painted of various colors, partly to render them conspicuous and partly to distinguish them one from another. Sometimes floating buoys mark out the best channel for entering a dock; sometimes they warn the mariner away from sands, spits, and shoals; sometimes they mark out a continuous double line, as at Spithead, between which is the only salfe entrance for ships. The *bell-buoy* is an ingenious contrivance for rendering a buoy audible, whether it is visible or not; so long as any stream of water, whether caused by a tide or a current, passes through the lower part of the buoy, it moves an undershot water-wheel, which rings a bell. The lighting of coast-buoys by means of compressed gas has been done of late. Experiment proved that buoys 5 ft. by 3 ft. could contain enough gas (made from shale-oil refuse or the like) to keep up a brilliant light for a month or more at a time.

BUOY'ANCY, of Ships: amount of weight which can be buoyed up by the hull. The buoyancy of a vessel is proportionate to the weight of water displaced by its presence (see HYDROSTATICS), and the rule for finding it has been stated as follows: The cubic ft. of the part of a vessel to be immersed being known, multiply it by the weight of a cubic foot of water (62.5 lbs.), and the product will be the weight of water displaced: from this subtract the weight of the vessel, and the result will be the buoyancy or the weight that a vessel will carry without sinking lower than the given line. It is admitted, however, by naval architects, that all the old rules concerning buoyancy, displacement, and flotation, must undergo modification by the introduction of iron ships, paddle and screw propulsion, and the increased weight of broadside.

BUOY'-DUES: small sums payable in some countries by shipping for the maintenance of buoys.

BU'PHAGA: see BEEFEATER.

BUPRESTIS, *bū-prĕs'tĭs:* Linnæan genus of coleopterous (q.v.) insects, now divided into a number of genera, and forming a tribe or family, *Buprestidæ*, of which some hundreds of species are known, most of them

belonging to tropical countries, and remarkable for the splendor of their colors. The colors are generally metallic in their lustre, have frequently a burnished appearance, and are often beautifully iridescent. One of the largest species, *B. gigas,* is a native of Cayenne: it is about 2 inches long. The English and other European species are all comparatively small. Most of the species spend the night on trees, shrubs, and other plants, flying about during the hottest part of the day. Some of them are popularly known as GOLDEN BEETLES. Plants are sometimes seen studded with them in the morning, as with gorgeous flowers. The golden *elytra* (wing-cases, see ELYTRA) of some species are used to enrich the embroidery of the Indian zenama; and the lustrous joints of the legs are strung on silken threads, and form necklaces and bracelets of singular brilliancy. The larvæ seem sometimes to be transported from one country to another in timber.

BUR, or BURR, n. *ber* [Dan. *borre,* a burdock: F. *bourre,* flocks or locks of wool: It. *borra,* any kind of stuffing: Gael. *bior,* a thorn, a prickle]: a rough prickly covering of the seeds of some plants; the seed-vessel of the burdock—the *Arctĭum lappa,* ord. *Compŏsĭtæ,* sub-ord. *Cynărōcĕph'alæ;* the rough edge left by a tool in cutting metal. BURR'STONE, certain silicious rocks used as millstones—so named from their rough grittiness; also BURLSTONE, n. *bėrl'stōn,* or BUHRSTONE (q.v.). BUR-REED, a British plant with sword-leaves, found in ponds and ditches, of the genus *Spargā'nĭŭm,* ord. *Arācĕæ.*

BUR, in an Engraving: slight ridge of metal raised on the edges of a line by the *graver or the dry point.* As the bur produces an effect like a smear, it is usually regarded as a defect, and scraped off. Some etchers, however, take advantage of it to deepen their shadows, and Rembrandt used it thus with telling effect.

BURANHEM, or BURUNHEM: see MONESIA BARK.

BURANO, *bô-râ'nō:* island and town of n. Italy in the Adriatic, about 5 m. n.e. of Venice. The island supplies a large proportion of the vegetables consumed in Venice. Burano has some lace-manufactures, boat-building, and an extensive ropeworks, but the inhabitants are employed chiefly in fishing. Pop. of town 4,699.

BURBAGE, or BURBADGE, *ber'bij,* RICHARD: English actor, d. 1619; son of James Burbage, an actor. He was the first licensed English actor (1574), and was for many years associated with Shakespeare, and acted in leading characters.

BURBANK, *Bur'bank,* LUTHER: American horticulturist: b. Lancaster, Mass., 1849, March 7. His education was completed in the public school of his native town and at an early age he entered the employ of the Ames Plow Company, and even then showed his in-

ventive genius by designing an improvement in the wood-working machinery. He finally gave up work in the shop to take up the study of horticulture, as he had always been interested in the study of nature, and particularly in plant life. His first marked success was in the improvement of the potato, and he soon afterward brought forth the variety now known as the 'Burbank.' He moved to California in 1875 and opened an experimental garden at Santa Rosa, where he has scored his greatest triumphs in developing and perfecting such a large variety of fruits, vegetables, and flowers and which have since become world-famous. Mr. Burbank's methods have been and are absolutely new and original and unique, his studies having shown him that several methods of perfecting and making anew from the old are practicable and feasible.

Breeding from selected individuals of a species which show unusual qualities; the inter-breeding of different types within a species, or 'crossing;' the inter-breeding of different species, 'hybridization;' and the development of 'mutations' or types which originate from new conditions and causes often unknown but which remain constant; these are the principal methods used by Burbank in his wonderful work. Probably the best known and most important types of fruit which he has produced are as follows: the Burbank plum, a cross between the American and Japanese varieties; the stoneless plum, a cross between a wild plum with the stone taken out and the cultivated variety; the plumcot, an entirely new variety brought about by the crossing of the plum and the apricot. This plumcot has the outward appearance of the apricot but is of a richer flavor and is darker in color. He has also produced numberless varieties of berries, apples, etc.

Among the best known of his productions in flowers are the double daisy, a development of the common daisy; a cross between the nicotenæ and petunias, known as the 'Nicotunia;' a blue and crimson variety of poppy, brought about by careful selection and breeding from the common California poppy; the 'Australian Star Flower,' a cross between several varieties of Australian flowers, a flower which is of pink shade and, when the stalk is cut, does not wither; and besides these several varieties of roses and lilies.

Of new vegetables Burbank has introduced, besides the Burbank and several other new potatoes, new tomatoes, squashes, asparagus, etc. Perhaps the most interesting of his experiments in this field is his attempt, apparently destined to be successful, to produce a spineless and spicule-less cactus (the spicules are the minute spines, much more dangerous and harder to get rid of than the conspicuous long, thorn-like spines), edible for stock, and indeed for man. This work is chiefly one of pure selection, for the cross-bred forms seem to tend strongly to revert to the ancestral spiny condition,

Among the best known stoneless and seedless fruits are, the Gold and Wickson apple, October Purple, Chalco, American, and Climax plums, and the Splendor and Sugar prunes. The latter have been produced by crossing a small wild plum with only part of the stone of the French prune, under which process the percentage of stoneless fruits gradually increases. The Sugar prune promises to supplant its French progenitor in California. In 1905 the Carnegie Institution made a grant of $100,000 to B., payable $10,000 annually, to enable him to note, collect and collate the scientific data which his extensive experimentation is constantly affording. He has written but little, and those desiring fuller information regarding the results of his work are referred to the brief series of Catalogues, under the title of *New Creations*.

BURBOT, n. *bėr'bŏt* [F. *barbote*—from *barbe*, beard], (*Lota vulgaris*): fresh-water fish of the same genus with the Ling (q. v.), and of the same family with the Cod, Haddock, etc., *Gadidæ*. It is found in the Cam, the Trent, and other rivers of the eastern and midland counties of England, and in various parts of the n. of Europe, and at least as far s. as Switzerland; in Siberia and other parts of Asia, even, it is said, in India. In English rivers, it often reaches two or three lbs. in weight, but has been taken of eight lbs.; and in some parts of Europe it is said to reach 10 or 12 lbs. In appearance the B. much resembles the ling, but is rather thicker at the neck, and tapers rather more rapidly, although still of somewhat elongated form. It has two dorsal fins, the first short, the second very long, and a very long anal fin. It differs from the ling in the form of the tail-fin, which is oval and slightly pointed; but agrees with it in having a single barbule on the lower jaw. It is of a yellowish-brown color, clouded and spotted with darker brown on the upper parts; the under parts lighter; the scales are small, and the whole body is covered with a mucous secretion. The flesh is white, firm, and of good flavor. Its liver yields an oil similar to cod-liver oil.

BURCKHARDT, *bėrk'hârt*, John Lewis: 1784, Nov. 24—1817, Oct. 15; b. Lausanne, Switzerland: African traveller. In 1806 he went to London, and was introduced by Sir Joseph Banks to the African Assoc., which accepted his services to explore the route of Hornemann into the interior of Africa, and he embarked for Malta, 1809, Feb. 14. He had previously qualified himself for the undertaking by a study of Arabic, and by inuring himself to hunger, thirst, and exposure. From Malta he proceeded, under the disguise of an oriental dress and name, to Aleppo, where he studied about two years, at the end of which time he had become so proficient in the vulgar Arabic that he could safely travel in the disguise of an oriental merchant. He visited Palmyra, Damascus, Lebanon, and other remarkable places, and then went to Cairo, his object being to go

thence to Fezzan, and then across the Sahara to Sudan. No opportunity offering itself for that journey he went to Nubia. No European traveller had before passed the Derr. In 1814 he travelled through the Nubian desert to the shore of the Red Sea and to Jeddah, whence he proceeded to Mecca, to study Islamism at its source. After staying four months in Mecca, he departed on a pilgrimage to Mount Arafat. So completely had he acquired the language and ideas of his follow-pilgrims, that, when some doubt arose respecting his Mohammedan orthodoxy, he was thoroughly examined in the Koran, and was not only accepted as a true believer, but also highly commended as a great Moslem scholar. In 1815 he returned to Cairo, and in the following year ascended Mount Sinai. The Fezzan caravan, for which he had waited so long, was at last about to depart, and B. had made all his preparations for accompanying it, when he was seized with dysentery at Cairo, which terminated his life in a few days, at the early age of 33. As a holy *sheik*, he was interred with all funereal honors by the Turks in the Moslem burial-ground. His collection of oriental MSS., in 350 vols., was left to the Univ. of Cambridge. His journals of travel, remarkable alike for their interest and evident truthfulness, were published by the African Assoc. B.'s inherent love of adventure was accompanied by an observant power of the highest order. His personal character recommended him to all with whom he came in contact, and his loss was greatly deplored, not only in England, but through Europe. His works are: *Travels in Nubia* (1819); *Travels in Syria and the Holy Land* (1822); *Travels in Arabia* (1829); *Notes on the Bedouins and Wahabis* (1830); and *Manners and Customs of the Modern Egyptians* (1830).

BUR'DEKIN: river in n.e. Australia, colony of Queensland; 350 m. in length. It has four mouths; the principal one, about two m. wide, discharges its water into Upstart Bay, under the name of Wickham river; two others enter Bowling Green Bay; and the fourth, Cleveland Bay. The soil of its deltas is well adapted to the cultivation of rice, tobacco, sugar-cane, and coffee. The natives in its region are more intelligent than their southern neighbors.

BURDEN, n. *bėr'dn*—sometimes written BUR'THEN [AS *byrthen;* Icel. *byrthr*, a load, a burden: Ger. *bürde*, a burden —from *beran*, to bear]: something carried; a load; something grievous or oppressive; a ship's capacity for carrying (see TONNAGE): V. to lay on a load; to oppress. BUR'DENING, imp. *-dn-ĭng*. BUR'DENED, pp. *-dnd*. BUR'DENER, n. *-dn-ėr*, one who. BUR'DENSOME, a. *-dn-sŭm*, grievous to be borne; fatiguing; oppressive. BUR'DENSOMELY, ad. *-lĭ*. BUR'DENSOMENESS, n. PUBLIC BURDENS, local rates and imperial taxes imposed upon the public (see PUBLIC BURDENS). BURDEN OF PROOF, in any dispute, or in a suit at law, the obligation which rests on one of the parties to prove his case — generally designated by the Latin phrase *onus proban'di* = the burden of proof.—SYN. of 'burdensome': heavy; weighty; ponderous.

BURDEN, n. *bėr'dn*, as in BURDEN OF A SONG [F. *bourdon*, the hum of a bee, the drone of bagpipes: Gael. *burdan*, a humming noise—from *burd*, a hum or buzz]: the bass or accompaniment to the treble; repeated words or sentiments at the end of each verse or division of a song; the ditty or undersong; the chorus; the refrain; the prevailing sentiment or story running through a song or other poetical composition; the main topic. *Note.*—This word, though spelled in same way, has no connection with *burden*, a load; nor does it primarily signify the current of sentiment with which a song is loaded.

BURDEN, *bėr'dn*, HENRY: 1791–1871; b. Dumblane, Scot.: inventor. He was reared on a farm; but early showed inventive genius, and after a course of study in mechanics, emigrated to America 1819, and settled at Troy, N. Y. His principal inventions are: an improved plow; a cultivator (1820); wrought-iron spikes (1825); a machine for making hook-headed spikes (1840), since used almost universally in the construction of railroads; a machine that makes 60 complete horseshoes per minute (1857). In 1822 he became agent of the Troy iron and nail factory, to which furnaces and rolling-mills were attached until the works were among the largest in the world; and Burden became ultimately sole proprietor of them. He was a generous giver for benevolent purposes.

BURDEN OF PROOF: in Legal Procedure has a double meaning, but in general is the obligation to establish by evidence certain facts determined and required by the pleadings or by the status of the legal investigation; and, as a general rule, this burden of proof lies on the party asserting the affirmative of the issue to be tried or question in dispute, according to the maxim *ei incumbit probatio qui dicit non qui negat* —that is, proof is incumbent on him who asserts, not on him who denies. The principle of the law is, that the burden of proof is on the party who would fail if no evidence were adduced on either side. Accordingly, it almost always rests on the plaintiff in an action, or on the party asserting the facts on which the result of the litigation must depend. In one case in England, tried before the late Baron Alderson, that learned judge laid down that the proper test was, *Which party would be successful if no evidence at all were given?* the burden of proof, of course, falling on the party not in that position. This test has since been generally adopted and applied; but Mr. Best, in his learned work on the *Principles of Evidence*, improves on it by the suggestion, that in strict accuracy the test ought to be, 'Which party would be successful if no evidence at all, *or no more evidence*, as the case may be, were given?' a consideration on which the discretion and judgment of counsel frequently depend. But although such, in gen-

eral, is the position of the plaintiff, it sometimes happens that the burden of proof is imposed on the defendant, in consequence of his having the affirmative of the material issue to be tried. It s to be noted that in a *civil* suit, when the assertion is seen to be probable, the obligation of the burden of proof does not lie: whereas in a criminal case no conviction can be had unless the evidence shows guilt beyond reasonable doubt.

It is this rule as to the burden of proof that demonstrates the real nature of the plea of *not guilty* in a criminal prosecution, and which divests that plea of the frequent objections of scrupulous sentimentalists; for the meaning of that plea is not necessarily an assertion by the prisoner that he is absolutely guiltless or innocent, but that he wishes to be tried, and that the burden of proof is on the prosecutor, while he has the presumption of innocence in his favor.—Besides the work referred to, see Starkie on the *Law of Evidence in England*, and Dickson on the same subject in Scotland, and Wigmon on *Evidence*.

BURDER, George: 1752, June—1832, May; b. London: Congregational minister. After studying as an artist he devoted himself to the ministry, and in 1778 was appointed pastor of an Independent Church at Lancaster. He afterward removed to Coventry, and 1803 to London. Here he became sec. to the London Missionary Soc., and editor of the *Evangelical Magazine*. Burder was greatly esteemed, and was prominent in all the religious movements of his time. His *Village Sermons* have been translated into several European languages; and he was the author of other series of sermons and publications which have had immense circulation.

BURDETT', Sir Francis, Bart.: 1770, Jan. 25—1844, Jan. 23: popular English politician. Educated at Westminster School and Oxford Univ., he spent some years on the continent and was a witness to the progress of the first French Revolution. In 1793 he married Sophia, youngest daughter of Thomas Coutts, Esq., the wealthy London banker, and in 1796 was elected M.P. for Boroughbridge, Yorkshire. In 1797, on the death of his grandfather, he succeeded to the baronetcy. In the house of commons he was conspicuous by his opposition to government and the war, and his advocacy of parliamentary reform, Roman Catholic emancipation, and other liberal measures, most of which were afterward carried. One of the most effective political speakers of that excited period, he for many years prominently occupied public attention, and was the favorite of the London populace. Having succeeded in obtaining a parliamentary inquiry into the abuses of the metropolitan prisons, he became, 1802, a candidate for Middlesex. He was first returned, then unseated, and after a second contest, defeated. At the general election of 1806, Burdett again became a candidate for Middlesex, but was defeated.

In 1807, May, he fought a duel with Mr. James Paull, one of the candidates for Westminster the previous year. Soon afterward he was returned, with Lord Cochrane, for Westminster, which he represented for nearly 30 years. Burdett having in 1810 published in Cobbett's *Political Register*, a Letter to his Constituents, declaring the conduct of the house of commons illegal in imprisoning John Gale Jones, the speaker's warrant was issued for his apprehension, as being guilty of a breach of privilege. Refusing to surrender, he for two days barricaded his house, the populace supported him in his resistance, and in a street contest between them and the military some lives were lost; but on April 9, the sergeant-at-arms, aided by the police and military, obtained an entrance, and conveyed him to the Tower. The prorogation of parliament restored him to liberty. Prosecuted, 1819, for a libel contained in a Letter to his Constituents, strongly animadverting on the proceedings of the magistrates and yeomanry at the memorable Manchester meeting, he was sentenced to three months' imprisonment in the King's Bench, and to pay a fine of £1,000. In 1835 he deserted the liberal party and joined the conserv. In 1837 he was returned for Wiltshire. Died in London.

BURDETT-COUTTS, Angela Georgina, *baroness:* daughter of Sir Francis Burdett; b. 1814, Ap. 21; d. London, 1906, Dec. 30. She inherited a large fortune from her grandfather, Thomas Coutts, in 1837, which she devoted to works of philanthropy. She spent large sums of money in building and endowing churches and schools; endowed the three colonial bishoprics of Cape Town, Adelaide, and Brit. Col.; founded in S. Australia an establishment for the improvement of the aborigines; presented several handsome fountains to London, and built Columbia Sq., consisting of model dwellings for about 300 families at low rents. The home established by her at Shepherd's Bush has rendered great assistance to many unfortunate women, and the People's Palace owes much to her generosity. In 1871 she was created a peeress in her own right as Baroness Burdett-Coutts. In 1877 she organized the Turkish Compassionate Fund, to relieve the sufferings of the peasants in Turkey. In 1881 she was married to William Ashmead-Bartlett.

BURDICK, Francis Marion: an Amer. jurist and legal writer; b. 1845, Aug. 1, in De Ruyter, N. Y.; was graduated at Hamilton College 1869, and at its law school 1872; practiced in Utica, N. Y., 1872–83; was Prof. of Law at Hamilton College 1882–87; at Cornell Univ. School of Law 1887–91; mayor of Utica 1882–83; U. S. Assay Com. 1889; and Prof. of Law, Columbia Univ. 1891. His writings include *Burdick's Cases on Torts; Cases on Sales; The Law of Sales;* etc.

BURDOCK, n. *bĕr'dŏk*, or Bur-weed, n. [*bur*, and *dock*], (*Arctium*): genus of plants of the great nat.

ord. *Compositæ* (q.v.), tribe *Cynarocephalæ*. The heads of flowers are globose, or nearly so: and each of the scales of the involucre runs out into a long rigid prickle, which is hooked at the point. The common Burdock *(A. Lappa)*, of which varieties very slightly distinguished have sometimes been described as species *(A. Bardana*, etc.), is abundant in waste and bushy places, by waysides, etc., throughout Europe where soil is rich. Its root is biennial, large, and fleshy, somewhat carrot-shaped; the root-leaves large, stalked, heart-shaped; the stem, stiff, upright, somewhat branched and leafy, three ft. or more high. The whole aspect of the plant is coarse, and it is somewhat clammy to the touch. The root is sometimes used in medicine, being diaphoretic and diuretic, and acting upon the cutaneous system and the kidneys. It is capable of being made a substitute for sarsaparilla. When fresh it has a disagreeable smell, but when dry, it is inodorous; it has a sweetish mucilaginous taste, becoming afterward bitterish and rather acrid, and contains chiefly inuline, bitter extractive, mucilage sugar, and a little tannin. In many countries, the roots, young shoots, and young leaves of Burdock are used in soups; and the plant is cultivated for this use in Japan. The roots are said to resemble artichokes in taste. The leaves and their expressed juice are sometimes applied to burns and suppurations.

BURDWAN, *bŭrd-wân'*, or BARDWAN: city in the dist. and division of the same name in the govt. of Bengal, on the East Indian railway, 67 m. from Calcutta. It is miserably built, and since 1863, has suffered severely through fever. It contains a palace of the Maharajahs, and a large collection of temples. Pop. about 35,000.

BURDWAN, the district of which the above city is the administrative headquarters, is between Beerbhoom on the n., and Hoogly on the s.; 2,697 sq. m.; 512 inhabitants to the sq. m.—a proportion which certainly seems to justify its name that signifies *productive*. The dist. is largely engaged in the refining of sugar. It exports silk, rice, tobacco, jute, also iron and coal; the minerals brought chiefly from the mines of Bancoorah, the dist. on the w. Next to the capital, Culna, Syambazar, Raniganj, and Jahanabad are the chief towns. Pop. of dist. about 1,391,823.

The *division* of BURDWAN comprises 13,855 sq. m.; pop. about 7,393,954.

BUREAU, n. *bū'rō*, BUREAUS, or BUREAUX, n. plu. *bū'rōz* [F. *bureau*, a writing-table—from OF. *bure*, a reddish-brown—from mid. L. *burra*, rough red-cloth —the kind of cloth which covered the table]: a coarse woolen cloth made from brown fleece, covering a table; a table or chest of drawers with conveniences for writing and keeping papers; in the *United States*, a chest of drawers for keeping clothes, etc.; in *France*, the office of an ambassador, state secretary, etc., for business;

the whole staff officers of a department. BUREAUC'RACY, n. *-rŏk'ră-sĭ* [F. *bureau*, and Gr. *kratĕō*, I govern]: the system by which the public service of a country is carried on in departments, each one under the control of a head; governed by or under the influence of officials; red-tapism: a style of government exemplified in some European states, where a host of government officials, regularly organized and subordinated, and responsible only to their chiefs, interfere with and control every detail of public and private life—the evil which the Germans call 'much-government' (*vielregieren*). BU'REAUCRAT'IC, a. *-rō-krăt'ĭk*, relating to or having the form of a bureaucracy; also BU'REAUCRAT'ICAL. BU'REAUCRAT'ICALLY, ad. *-lĭ*. BUREAUC'RATIST, n. *-rŏk'-ră-tĭst*, an advocate for or supporter of.

BURETTE, n. *bû-rĕt'* [F., a cruet, a vase]: a graduated glass tube with stop-cock for delivering measured quantities of liquids.

BURG, or BURGH, n. *bėrg*—BURGH, n. in Scot *bŭr'ă;* also BOROUGH, *bŭr'ō*, which see [AS. *burg;* mid. L. *burgus*, a small fortified place]: at first the fort or or castle for the protection of the *burgh*, then a fortified town; a city or corporate town that sends, or unites in sending, a member to parliament; a town with certain privileges. BURGHAL, or BURGAL, a. *berg'ăl*, of or pertaining to a city or corporate town. ROYAL BURGH, a town holding a charter from the crown. BURGH OF BARONY, one erected by a feudal lord or superior.

BURGAGE, n. *bêrg'āj* [mid. L. *burgāgĭŭm*, an annual tax paid by the inhabitant of a *bourgh* or *burgh* for his property to the superior or lord—from *burgus*, a small fort: Gr. *purgos*, a tower]: a tenure of an ancient annual payment by which property is held in cities and towns. BUR'GESS, n. *-jĕs* [OF. *burgeois* and *burgeis*, a citizen—from mid. L. *burgen'sis*, the dweller or freedman in a *bourgh*]: a citizen or freeman of a city or corporate town. BURGESS-SHIP, n. the state or quality of a burgess. BURGHER, n. *bėrg'er*, the freeman or inhabitant of a burgh; one of a religious sect in Scotland. BURGH'ERSHIP, n. BOURGEOIS, n. *bôr-zhwâ'* [F.]: a burgess. BURGEOIS, or BOURGEOIS, n. *bėr-joys'*, a small printing-type. BURG-MOTE, n. *bŭrg'mōt* [AS. *burg* or *borough; mot*, meeting]: in AS. times, a borough court.

BURGANET, n. *bēr'ga-nĕt*, or BUR'GONET, n., or BURGUINET, n. *bēr'gi-nĕt* [OF. *bourguignote:* Sp. *borgonota*]: in *OE.*, a sort of helmet—so named as first used by *Burgundians.*

BURGEE, n. *bėr'jē:* a kind of small coal suitable to be burned in the furnaces of engines; a flag ending in two points. It is used in cutters, yachts, and merchant vessels.

BUR'GEO ISLANDS: a group belonging to England; between Newfoundland and Cape Breton, lat. 47° 33′ n., long. 57° 44′ w. Besides being valuable as a fishing-station, they occupy a commanding position with respect to British N. America in general and the Gulf of St. Lawrence in particular. The group has 700 inhabitants.

BURGEOIS: see under BURGAGE.

BURGEON, v. *bĕr'jŭn:* see BOURGEON.

BÜR'GER, GOTTFRIED AUGUST: 1748, Jan. 1—1794, June 8; b. Molmerswende, near Halberstadt, Prussian Saxony: popular German poet. In his boyhood, he showed no capacity for hard study, and was particularly averse to Latin; yet he had a relish for verse, though destitute of any other model than the Psalm-book. In 1764, he went to Halle, and applied himself to theology. In 1768, he turned to jurisprudence, which he studied at Göttingen. Here his conduct was careless and immoral, and he would probably have sunk into obscurity, if the intimacy which he happily formed with Voss, the two Stolbergs, and other young poets, had not stirred up his better nature, and inspired him with ambition to excel. He labored hard at the classics of ancient and modern times, but the study of Shakespeare and Percy's *Reliques* had the greatest influence in deciding his poetic style. Regarding the intrinsic merits of his poems, chiefly ballads and songs, even German critics—such as Schiller, Gervinus, and Vilmar—differ widely; but all agree in praising the popular style and fluent spirited versification of his ballads, *Leonora, Lenardo and Blandine,* the *Parson's Daughter of Taubenhayn,* the *Wild Huntsman,* etc. Bürger's life was spent in great poverty and misery, partly the result of misfortune, and partly of his own errors. He married thrice, in two instances very unhappily; lost his property by an unfortunate speculation; and though the favorite poet of the German people, was left to earn his bread by translations and similar literary labors. Though a popular writer Bürger was very careful as to style, and was one of the first who wrote good hexameter verse in German. Since 1798 there have been numerous complete and partial editions of his works. See Bürger's life by Döring (1826), and by Pröhle (1856).

BURG'ERMEISTER: German term for BURGOMASTER (q.v.).

BURGES, *bĕr'gĕs,* TRISTAM, American statesman and orator; b. Rochester, Mass., 1770, Feb. 26; d. Providence, R. I., 1853, Oct. 13. When 15 years old he attended a school in the vicinity for six weeks, and again the next year for six weeks more. This was all the instruction he received from others until he reached the age of 21. In 1793, September, he entered Rhode Island College, now Brown University, graduated three years later with the first honors of his class, and was admitted

to the bar in 1799. He became a leader of the Federal party, and in 1811 was elected to a seat in the State legislature. In 1815 he was made chief justice of Rhode Island, and afterward became professor of oratory and belles-lettres in Brown University. In 1825 he was elected to Congress, and almost immediately achieved a national reputation by his speech on the judiciary. He continued in Congress until 1835. Many of his most brilliant efforts were in defense of the American tariff system, and his logic and sarcasm won for him an unrivaled reputation as a debater. See Bowen, *Memoirs of Tristam Burges.*

BUR'GESS, or BURGH'ER [from the same origin as borough (see BURGAGE)]: in a very general sense, a citizen; but has a variety of special meanings, according to local institutions. In French literature, the word *bourgeois* is generally used to personify the excess of plebeian vulgarity; while on the other hand, in England, the aristocratic member of parliament for a city is technically called a burgess. In almost all parts of Europe, when used in a technical sense, the word means a person who holds some peculiar privilege in a town or municipal corporation. The burgesses of the European towns, indeed, were, and still nominally are, an interesting relic of ancient Roman institutions, existing in contest and rivalry with the institutions of feudality. The Burgess, with a different name, is virtually the civis or citizen of the Roman municipality. It was a rank always of some moment, but especially valuable when the citizenship was of Rome, the metropolis. The apostle Paul, when he was to be scourged, raised the alarm of the chief captain by stating that he was a Roman. Such an event might often have happened in the middle ages, when a Burgess, brought before the court of a feudal lord, claimed the privilege of pleading in his own burghal court, or the king's tribunal. The European monarchs found it to their interest to support the burgesses as a check on the influence of the feudal aristocracy; and thus was nourished the great system of city communities, which have exercised so important an influence on the fate of the world. See MUNICIPALITY.

In the law of England a Burgess is a member of the corporation of a corporate town, or he may be described as a freeman duly admitted as a member of the corporate body. This privilege was, and to some extent still is, acquired by birth or servitude—that is by being born of a freeman, or by apprenticeship for seven years within the borough to a freeman. Formerly it might be obtained also by gift or purchase: see TOWN-COUNCIL.

In the Scotch law the old definition of Burgess is still maintained. This is very similar to the old English one above mentioned, with the addition of admission to the privilege *by election of the magistrates of the burgh*

—the burgesses taking, on the occasion of their admission, a quaint form of oath, in which they confess the religion of the country, loyalty to the queen, to the provost and bailies of the burgh and their officers, and declaring *inter alia*, that they will 'make concord where discord is, to the utmost of their power.'

BUR'GESS, Alexander, American Protestant Episcopal bishop: b. Providence, R. I., 1819, Oct. 31; d. St. Albans, Vt., 1901, Oct. 8. He was a younger brother of George Burgess, first bishop of Maine. He was graduated from Brown University in 1838, and from the General Theological Seminary in 1841. He was successively rector at East Haddam, Conn., 1842–3; St. Mark's, Augusta, Me., 1843–54; St. Luke's, Portland, Me., 1854–67; St. John's, Brooklyn, N. Y., 1867–9; and Christ Church, Springfield, Mass., 1869–78. In 1878 he was consecrated first bishop of the diocese of Quincy, Ill. He wrote a popular religious text-book, *Questions for Bible-Classes and Sunday-Schools* (1855), and a *Memoir of the Life of George Burgess, First Bishop of Maine* (1869).

BUR'GESS, Edward, American naval architect: b. West Sandwich, Mass., 1848, June 30; d. Boston, 1891, July 12. He was educated at Harvard, where he graduated in 1871, and became secretary of the Boston Society of Natural History. He was instructor of entomology at Harvard from 1879 to 1883. He then became a designer of sailing-yachts. In 1884 he designed the Puritan, the winner of the America's cup in 1885; and a year later the Mayflower, the winner in 1886. He was also the designer of the Volunteer, which won the cup in 1887.

BURGESS, Frank Gellett, American humorous writer and illustrator: b. Boston, 1866, Jan. 30. He was graduated from the Massachusetts Institute of Technology in 1887; was a draughtsman with the Southern P. Ry. 1887–90, and instructor in topographical drawing in the University of California, 1891–4. In 1895–7 he came prominently before the reading public as a publisher and writer of eccentric and humorous literature, such as his journal called *The Lark*, and poem, *The Purple Cow* (1897). In 1898 he removed to London, but returned to America in 1900. He edited *Petit Journal des Refusées* (1897), and has written *The Lark Almanac* (1898); *Vivette* (1898); *The Nonsense Almanac* (1898); *The Lively City o' Ligg* (1898); *Goops and How to be Them* (1900); *A Joyous Journey Round the Year* (1901); *Romance of the Commonplace* (1902); *A Gage of Youth* (1901); *The Reign of Queen Isyl* (1903); etc.

BURGESS, George, bishop of Maine: b. Providence, R. I., 1809, Oct. 31; d. Haiti, 1866, April 23. After graduating at Brown University, and holding a tutorship in that college, he traveled in Europe, and studied

for two years in the universities of Göttingen, Bonn, and Berlin. He was rector of Christ Church in Hartford from 1834 to 1847, when he was consecrated first bishop of the diocese of Maine, and became, at the same time rector of Christ Church in Gardiner. Both offices he filled with great ability. He published two academic poems, a metrical version of a portion of the Psalms, *Pages from the Ecclesiastical History of New England* (1847); *The Last Enemy Conquering and Conquered* (1850), and various sermons.

BURGESS, James, Scottish archæologist: b. Kirkmahoe, Dumfriesshire, 1832, Aug. 14. He went to India in 1855, and there entered upon educational work in Calcutta and Bombay. In 1886 he was made director-general of the archæological surveys of India, retiring under age limit in 1889. From 1872 to 1884 he published the *Indian Antiquary*. His works include: *The Temples of Shatrunjaya* (1869); *The Rock Temples of Elephanta* (1871); *Scenery and Architecture in Gujarat and Rajputana* (1873); and other books; also many writings in the *Epigraphia Indica, Archæological Reports* (1874–87), etc.

BURGESS, John William, American educator: b. Cornersville, Tenn., 1844, Aug. 26. He was educated at Cumberland University, Lebanon, Tenn., and at Amherst College, Mass., graduating there in 1867; studied law, and began to practise in 1869. During this year he was appointed professor of English literature and political economy at Knox College, Galesburg, Ill. Two years later he studied in Göttingen, Leipsic, and Berlin. On his return, he became professor of history and political science at Amherst, and in 1876 professor of history, political science, and international law in Columbia College, and there in 1880 he was made professor of constitutional and international history and law. He has published *Political Science and Comparative Constitutional Law* (1890); *The Middle Period of United States History* (1897); *The Civil War and the Constitution* (1901); *Reconstruction and the Constitution* (1902); and numerous magazine essays on kindred subjects.

BURGESS, Neil, American actor: b. Boston, 1846. Not long after entering the theatrical profession, he undertook in a stage emergency to fill the place of an actress, and his success in the humorous female role assumed led to his entering that line permanently. He acted in *Josiah Allen's Wife* and in *Widow Bedott*. The latter was very popular, as was also *Vim*, produced in 1883. *The Country Fair*, a play which he brought out in 1889, ran for more than two years. Mr. Burgess has lately undertaken vaudeville acting.

BURGH, BURGHAL: see under Burg.

BURGH [see Burg]: descriptive name of towns and cities in Scotland, corresponding to the English word

Borough (q.v.). There were *burghs of barony, free burghs, burghs of regality,* and *royal burghs.* Since 1832, there have been what are called *parliamentary burghs*—that is, towns or burghs not being royal burghs, but sending or contributing to send representatives to parliament. By the general police act for Scotland, the word Burgh was declared to mean also any populous place, the boundaries of which are fixed by the act.

Burghs of Barony are corporations consisting of the inhabitants of determinate tracts of ground within the *Barony* (q.v.), and municipally governed by magistrates, whose election is either dependent on the baron or lord of the district, or vested in the inhabitants themselves. Sometimes their charter of incorporation gave them power to create subordinate corporations and crafts, as in royal burghs; but all exclusive privileges of trading in burghs are now abolished. In other respects the general corporate law of the country applies to burghs of barony; as to which see below, Burghs, Royal. They have power to administer their common good, to elect their burgh-officers, to make by-laws, and their burgesses are entitled to challenge the sale or other disposition of the burgh's property.

Burghs, Free, were burghs of barony enfranchised by crown charter with rights of trade, both home and foreign, but subjected to the same class of public burdens and taxation which royal burghs had to bear as the price of their peculiar privileges. Since the gradual decay and ultimate suppression of commercial monopoly, this classs of burghs has become extinct, or rather *all* burghs are now *free.*

Burghs of Regality were burghs of baronies, spiritual or temporal, enfranchised by crown charter, with regal or exclusive criminal jurisdiction within their own territories, and thence called *regalities* (q.v.). Some of these burghs of regality, especially those dependent on the greater bishops and abbots, were of high antiquity, and possessed jurisdiction and privilege of trade distinguishable from those of royal burghs, only by being more circumscribed in their limits. Since the abolition of hereditary jurisdictions, the distinction between burghs of regality and burghs of barony has practically ceased.

Burghs, Royal. A royal burgh is a corporate body deriving its existence, constitution, and rights, from a royal charter—such charter being either actual and express, or presumed to have existed, and by the accident of war and time, to have perished. In 1833, by act of parliament, a new constitution was given to royal burghs in Scotland, excepting a few in which the population was very small. This new establishment abolished the ancient 'close system.' By a later act 'burgh' is defined to mean all burghs and populous

places whose boundaries have been fixed; and it is provided that the sheriff may fix the boundaries and so constitute a burgh in this sense, for purposes of improvement and police, at the instance of seven or more householders.

BURGH ACRES: acres or small patches of land lying in the neighborhood of *Royal Burghs* (q.v.), usually feued or leased out to burgesses or persons resident within the burgh.

BURGHERS: name popularly given to a religious denomination in Scotland: see UNITED PRESBYTERIAN CHURCH.

BURGHS, CONVENTION OF: see CONVENTION OF ROYAL BURGHS.

BURGIN, GEORGE B., English novelist and journalist: b. Croydon, Surrey, England, 1856, Jan. 15. He became private secretary to Baker Pasha and accompanied him to Asia Minor as secretary of the Reform Commission in Armenia. In 1885 he returned to England and was for a time sub-editor of *The Idler*. Among his works are: *The Dance at the Four Corners; Tuxter's Little Maid; The Judge of the Four Corners; Tomalyn's Quest; Fortune's Footballs; The Cattle Man; The Hermits of Gray's Inn; The Bread of Tears; The Tiger's Claws; A Son of Mammon; A Wilful Woman; The Shutters of Silence; The Ladies of the Manor* (1903); *The Land of Silence* (1904); etc.

BURGKMAIR, *bûrk'mīr*, HANS: 1473–1531.; b. Augsburg: noted German painter and wood-engraver. He was father-in-law of the elder Holbein, and friend of Albert Dürer, whose influence is manifest in Burgkmair's works. Several excellent paintings by Burgkmair are in the galleries of Munich, Berlin, Augsburg, and Vienna. But he is best known as a wood-engraver, his cuts amounting to nearly 700. Among the most celebrated of these is his *Triumph of the Emperor Maximilian*, in 135 cuts, with a description by the emperor himself. Another fine series of 237 cuts, called *The Wise King*, represents the deeds of Maximilian. He died at Augsburg.

BURGLAR, n. *bèrg'lèr* [Norm. F. *bourglaire*—from mid. L. *burgi-latro*, the robber of a dwelling: comp. Gael. *buarglacair*, a cattle thief—from *buar*, cattle; *glac*, to seize]: one who breaks into a house at night to steal; a house-breaker. BURGLA'RIOUS, a. *-lā'rĭ-ŭs*, pertaining to a theft by housebreaking. BURGLA'RIOUSLY, ad. *-lĭ*. BURG'LARY, n. *-lèr-ĭ*, the breaking into a house by night for the commission of robbery.

BURGLARY: in criminal law, a breaking and entering the house of another in the night, with intent to commit any felony therein, whether the felony be perpetrated or not. It is peculiar to this crime that it can only be committed in the *night-time*, which at com-

mon law is from sunset until sunrise, although by an English law it is considered as commencing at nine in the evening, and concluding at six in the morning of the next day. The intent accompanying the breaking and entry must be felonious; but if a felony be actually committed the act will constitute *prima facie* evidence of the felonious intent. As to the *place* of commission, burglary must be in a *mansion*-house, for such is the technical expression; but this is construed to mean any private dwelling, or any building temporarily or permanently used for that purpose. Generally, it cannot be committed in a barn, warehouse, or the like unless there be a communication with the dwelling-house, nor in a house where no one resides; though it may be committed in a store over which the owner resides (and in some states in a stable, or a railroad station). But it is burglary to break, in the night-time, with a felonous intent, into a house which is used as an occasional residence, and which the owner, is in the habit of leaving for a short period, with the intention of returning, even though no one be in the house at the time of the offense. A chamber in a college, or an inn of court, is also within the meaning of a mansion-house; so likewise is a room or lodging in any private house (according to the law in some states), if the owner and the lodger enter by different outer doors; but if they both enter by one outer door, then the house is described as that of the owner; and the case is similar of a building belonging to a corporation and separately inhabited by the officers of the body corporate; it is the mansion-house of the corporation, and not of the officers. Again, a shop which is part of another man's house, and hired merely for the purpose of work or trade, is not a dwelling-house, yet the law defines the crime of burglary as possible in it, though the punishment is not quite so severe. This offense cannot be committed in a tent or booth erected in a market or fair, though the owner may lodge therein, for his doing so makes it no more burglary to break open such an erection than it would be to uncover a tilted wagon under the same circumstances. But it may be committed by breaking open a church, which, according to Sir Edward Coke, is *domus mansionalis Dei*, that is, the mansion-house of God, and is now expressly protected. The common law respecting the *place of commission*, has undergone much change, by statute, so that now, in some jurisdictions, the crime may be committed in almost any kind of a house or room or building, including mill, barn, stable, tent, vessel, railroad car, and the like.

As to the *manner* of committing burglary, it is laid down by Blackstone that there must be both a breaking and an entry to complete it. There must, in general, be an actual breaking, a substantial and forcible irruption—as, at least, by breaking, or taking out

the glass of, or otherwise opening a window; picking a loek, or opening it with a key; nay, by lifting up the latch of a door, or unloosening any other fastening, or (in some states) tearing out a netting of twine nailed over an open window. But if a person leave his doors or windows open, without any barrier, however slight, to indieate that entrance is not to be made thereat, it is his own folly and negligence, and if he a man enter therein it is no burglary; yet if he afterward unlock an inner or ehamber door, it is so. To come down a chimney is held a burglarious entry, for that is as mueh closed as the nature of things will admit; so also to knock at a door, and upon its being opened, to rush in with a felonious intent; or, under pretense of taking lodgings, to fall upon the landlord, and rob him. The least entering, with only a part of the body, such as head, hand, or foot, constitutes the crime of burglary. If the servant eonspire with a robber, and let him into the house by night, this is burglary in both. By statute, in some states, this crime may also be committed though the entry be through an open door, window, or other aperture, without an aetual breaking.

The *intent* must also appear, otherwise the offense will amount only to a trespass; and it must be an intent to commit felony, which may be inferred from the conduet of the offender while in the house.

In the different states of the United States the common-law definition of burglary as a felony has been variously modified by statute. Thus, in Massaehusetts, the erime is ealled 'breaking and entering'; in New York it is divided into degrees, of which there are three, the distinetion between them being very teehnical: as for instance, whether the erime be committed in the day or night time; whether foreible entry of premises be made with the intent to eommit the erime, or whether its commission be an afterthought, through the eriminal's finding himself within the premises, ete. The punishment for burglary varies in different states as to the term, but in each state it consists of imprisonment. In New York, burglary in the first degree is punishable by imprisonment in a state prison for not less than ten years; burglary in the second degree, not more than ten nor less than five years; and burglary in the third degree not exeeeding five years. In states where burglary is defined as a felony committed at night (as in Connectieut), it has been held that the produetion of an almanac to show the hour at whieh the sun set on the day of the commission of the crime, is admissible, not exactly as evidence, but to refresh the memory of the witnesses. In some states, however, burglary is eommissible in the daytime as well as at night, while in other states breaking into premises with the intent to commit any crime, is defined as burglary.

Blackstone observes, that this offense was anciently called Hameseeken, as, he adds, it is in Scotland to this day. But the Scotch law on this subject has some points of difference—hamesecken, or hamesucken (in the Scotch books), not being quite identical with burglary: thus, the former is an offense exclusively against the *person*, and it may be committed in the daytime, as well as at night; and there are other points of dissimilarity. The Scotch law relating to *housebreaking* and *stouthrief* affords analogies. See HAIMSUCKEN; HOUSEBREAKING; STOUTHRIEF; LARCENY; ROBBERY; ASSAULT.

BÜRG'LEN: village of Switzerland, canton of Uri, about tow m. from Altrof; celebrated as the birthplace of William Tell. The supposed site of the patriot's house is now occupied by a chapel, upon the walls of which are represented certain well-known scenes from his history. Pop. about 1,500.

BURG MOTE: see under BURGAGE.

BURGOMASTER, n. *bėr'gō-măs'tėr*, or BURGH'MASTER [Ger. *bürgermeister*, a burgomaster, a mayor—from *bürger*, a burgess; *meister*, a master]: one employed in the government of a city; chief magistrate in the large towns of Holland, etc., analogous to the French *maire*, the English *mayor*, the Scotch *provost;* a name given to a kind of large sea-gull. See GULL.

BURGONET: see BURGANET.

BURGOS, *bôr'gōs:* city of Spain, cap. of the new province of Burgos, and of the former kingdom of Old Castile; in a fertile valley at the foot of the Sierra d'Oca, and on the right bank of the river Arlanzon; lat. 42° 20′ n., long. 3° 45′ w. Burgos is very ancient, having been founded 844. Many of the gloomy old houses of its early history remain. In the castle of Burgos Edward I. of England was married to Eleanor of Castile. The cathedral of Burgos, founded 1221, is one of the noblest specimens of Gothic architecture in Spain. Its various chapels are rich in fine sculpture and tombs. It was the birthplace of the Cid (q.v.). Burgos has manufactures of woolens, linens, and hats, but it depends chiefly on the traffic which its position on the great road from France and the n. Spanish provinces to Madrid secures. Burgos has several charitable and educational institutions. It formerly had a much larger population—as many as 50,000—but on the removal of the court to Madrid in the 16th c., Burgos began to decline in population and importance. It was further greatly injured 1808, Nov., by the French, who sacked it. In 1812, the castle was four times unsuccessfully besieged by Wellington, who, however, took it in the following year, when the French blew it up, as well as the fortifications. Pop. (1900) 30,167.

The province of BURGOS has 5,650 sq. m. The sur-

THE CATHEDRAL OF BURGOS.

face is elevated, the soil fertile, yielding grain and fruits. The hills afford rich pasturage; and gold, silver, iron, lead, and copper are found. Pop. (1900) 338,838.

BURGOUT, n. *bēr'gût*, or BURGOO, n. *bêr-gô'* [W. *burym*, yeast; *gawl*, gruel]: thick gruel used by seamen, seasoned with salt and butter.

BURGOYNE, *bêr-goyn'*, JOHN: British general and dramatist: 1730–92; commonly said to have been natural son of Lord Bingley. He entered the army early, and, 1759, Aug., was appointed lieut. col. commandant of the 16th Light Dragoons. In 1761, he served at Belle Isle, and in 1762 commanded a force sent into Portugal for the defense of that kingdom against the Spaniards, when he surprised and captured Alcantara. In 1776, he served in N. America in the war of the Revolution, and in the summer of 1777 he was appointed to the command of a large force ordered to penetrate from Canada into the rebellious districts. The early part of the expedition was marked by his capture of Ticonderoga; but neglecting to preserve his communications with Canada, he encountered the greatest difficulties, and was at last forced to surrender with his army to General Gates, at Saratoga. Soon after his return to England, having been denied an audience of the king, and refused a court-martial, he went over to the opposition party, and voluntarily resigned all his appointments. On a change of ministry, at the close of the American war, he was appointed commander-in-chief in Ireland. This office he resigned two years later, and subsequently seems to have devoted his time to light literature. He was the author of some pamphlets in defense of his conduct, and of *The Maid of the Oaks* (1780), *The Heiress* (1786), and other stock dramatic pieces. Burgoyne was one of the managers for conducting the impeachment of Warren Hastings. See *Episodes from the Life and Letters of Burgoyne*, by Barrington and Fonblanque (1876).

BURGOYNE, Sir JOHN FOX, Bart: 1782, July 24—1871, Oct. 7; natural son of Gen. John Burgoyne. He entered the Royal Engineers 1798; served in the Mediterranean 1800-07; was with Moore at Corunna 1809; and served under Sir Arthur Wellesley in the Peninsula till the conclusion of the war in 1814, being present at all its sieges. In 1814, he was commanding engineer of the expedition to New Orleans, and in 1826 of that sent to Portugal. In 1851 he obtained the rank of lieut.gen., and in 1854 was made D.C.L. of Oxford Univ. In the Crimean war he was chief of the engineering dept. of the British army till recalled 1855. For his services at Sebastopol, he received from the sultan the order of the Medjidie, and from the French emperor that of grand officer of the Legion of Honor. He was made general 1855, baronet 1856,

constable of the Tower in 1865, and filed-marshal 1868. See his *Life and Correspondence* (2 vols. 1873).

BURGUNDY, *bĕr'gŭn-dī:* a formerly independent kingdom of wide extent, later an old French province (Fr. *Bourgogne*), now divided between the depts. of Côte-d'Or, Saone-et-Loire, and Yonne. The ancient Burgundians (*Burgundi*), originally a German tribe, were at first settled on the banks of the Oder and the Vistula, afterward extended themselves to the Rhine and the Neckar, and, in 407 penetrated into Roman Gaul. Their conversion to Christianity took place in the course of eight days, and consisted in their adoption of a brief Arian confession of faith, and receiving baptism. From 407 to 534, the kingdom of Burgandy was several times divided; and in 451, Gundicar, King of Burgandy, with 10,000 men, confronted Attila, but was defeated and slain.

In 534, Burgandy passed under the rule of the Franks; but the weak government of the later Carlovingian kings allowed a part of it once more to assert a separate existence as a dependency of the empire under Boso of Vienne in 832. Boso's realm, known as Cisjuran Burgandy, or the kingdom of Arelate (Arles) lay mainly in the basin of the Rhone. A second Burgundian state arose about the same time in the country between the Saone and the Reuss, and was known as Transjuran or Upper Burgundy. These states, united in 930, were for a time powerful and famous; but in 1038, on the extinction of the royal dynasty, Burgundy became part of the German empire. It was afterward broken into several fragments, gradually absorbed by France.

A similar fate befell the third Burgundian state, the dukedom of Burgundy, or Lower Burgundy, formed by a brother of Boso. Yet the Dukes of Burgundy played a large part in the history of mediæval Europe, and were long the dangerous rivals of the French kings. The nucleus of the dukedom was in Lower Burgundy, which afterward became the French province of Burgundy, n. and w. of the other Burgundian realms; but the second line of dukes, beginning, 1363, with Philip the Hardy, son of the French king John, held under their sway not only Franche Comté and adjoining portions of France proper, but great part of the Low Countries. Charles the Bold (q.v.) was one of the most powerful sovereigns of Europe. Louis XI. of France succeeded in incorporating the duchy with the kingdom of France.

BURGUNDY, Louis, Duke of: 1682–1712; b. Versailles; grandson of Louis XIV. of France, and Dauphin of France after the death of his father. Even in childhood he was ungovernable, and became excessively violent and haughty, and abandoned to all gross and sensual passions. Although educated under the care

of the Abbé Fénelon, he used, when 30 years of age, to divert himself with drowning flies in oil, and blowing up living frogs with gunpowder. He had the misfortune to be deformed; his deportment and manners were undignified, and his mind was imbued with bigotry. When only about fifteen years of age, he was married to the Princess Adelaide of Savoy, and spent his time wholly in amusements in the company of his spouse and of the ladies of the court. Nevertheless, in 1701, he was nominally appointed generalissimo of the army, really under the command of the Duke de Vendôme, and is said to have shown some spirit in a cavalry-fight at Nimeguen; but he quarreled with Vendôme, chiefly because he had once been compelled to establish his headquarters in a nunnery. He lost the respect of the army, and was exposed to many humiliations, proceeding partly from intrigues set on foot against him out of envy by his father. He returned to the court more eccentric, gloomy, and unsociable than before. But when he became on his father's death, the second person in the kingdom, all his defects vanished from the sight of the courtiers, and flattery bestowed on him the title of the Great Dauphin. A few days before his sudden death, his wife and her son, the Duke of Bretagne, had died, and the same hearse carried father, mother, and child to St. Denis. The Duke of Orleans, subsequently regent, and his daughter, the Duchess of Berri, were accused, but without reason, of having caused them to be poisoned.

BURGUNDY PITCH: resinous substance prepared from common frankincense (q.v.), the spontaneous exudation of the Norway spruce-fir (*Abies excelsa*; see FIR) by melting it in hot water, by which means it is freed from much of the volatile oil which it contains. By straining it through a coarse cloth impurities also are removed. Burgundy Pitch is of a yellowish-white color, hard and brittle when cold, but softening by the heat of the hand, and readily adhering to the skin. It has a not unpleasant resinous odor, and a slightly bitter taste. It is used in medicine as an external application only, and generally acts as a mild irritant. A very common application of it is as a plaster in complaints of the chest, and in rheumatic complaints. It enters also as an ingredient with resin, oils, etc., into a compound plaster of similar use. The Burgundy Pitch of commerce is now principally brought from Hamburg; but the greater part of what is sold under that name is really manufactured of common rosin and palm-oil, or from American turpentine. It has a fuller yellow color than the genuine Burgandy Pitch, and a less agreeable odor.

BURGUNDY WINES: produce of vineyards chiefly on the hilly lands forming the Côte d'Or, between

Dijon and Chalons. These hills average 800 to 1,000 ft. in height; the vineyards ascend the slopes in terraces, and spread along the table-land on the summit. 'In richness of flavor and in perfume, and all the more delicate qualities of the juice of the grape, the wines grown here unquestionably rank as the finest in the world.' The most celebrated of the *red* wines of Burgundy are the Closvougeot (near Beaune), Nuits, Chambertin (the favorite wine of Louis XIV. as well as of Napoleon), the Romané-Conti, Richebourg, Volnay, and Pomard. Of other red wines of Burgundy not grown on the Côte d'Or, those of Pitoy, Perriére, Preaux, and Auxerre, are held in most repute. The *white* wines of Burgundy also are the finest in France, but, being produced in less quantity, have less celebrity. The quantity of wine annually produced in Burgundy averages 3,500,000 hectolitres (77,000,000 gallons), of which only about a fifth is consumed in the district.

BURHAUNPUR, or BURHÂNPUR, *bôr-han-pôr':* large town of India, territory of Gwalior, or possessions of Scindia's family; on the right bank of the Tapti, n. lat. 21° 18′, e. long. 76° 20′; 280 m. n.e. from Bombay. The banks of the Tapti are here bold, rising 60 or 70 ft. above the stream. The town is surrounded by a rampart of brickwork, and contains a palace built by Akbar. A few of the wealthier merchants have good houses, built of teak, and profusely decorated with carvings. The most wealthy people are the Borahs, a Mohammedan tribe, who inhabit a distinct ward, which they shut up at night, excluding all other persons. There are manufactures of muslins, flowered silks, and brocades, for which the place was formerly famous, so that, in the 17th c., they were exported in great quantities to Persia, Egypt, Russia, and Poland.

BURHEL, *bûr'ĕl*, or BHARAL, blue wild sheep (*Ovis nahura*) of Tibet; three feet tall; fleece dark ashy blue (in summer much browner), tail white, nose, throat, and front, and line along the sides deep black; horns smooth and two feet long.

BURI, *bô'rē*, the grandfather of Odin, in Norwegian mythology. According to the legends 12 streams flowed from the spring Hvergelmir in Niflheim (the region of shadows), and later in their course were frozen, thus surrounding the region of elemental fire (Muspelheim) with blocks of ice. From this ice came the giant Ymir and the cow Audhumla; from the cow's udder came four streams of milk with which the giant was fed. Audhumla was nourished by licking the salt ice-blocks, and as she licked them a man's hair appeared on the first day; a man's head on the second day and the whole man on the third day; this was Buri. He was of giant size and strength; he had a son Bor through whom he was the grandfather of Odin, Vili, and Ve.

BURIAL, n. *bĕr'ĭ-ăl* [see BURY: AS. *byrgels*, a sepulchre]: the act of burying; interment: ADJ. of or pertaining to interment, or a tombstone. Burial is a word of Teut. origin [Ang.-Sax. *birgan*, to conceal], applied to the prevalent method among civilized nations of disposing of the dead, by hiding them in the earth. Funeral customs are distinctive of the condition and character of a people, associating themselves with a wide variety of sentiments, from gentle and rational sorrow up to deification of the departed, accompanied sometimes with cruelty and ferocity toward the living. In disposal of the bodies of the dead, three methods have prevailed: 1. The simple closing up of the body in earth or stone; 2. The burning of the body, and the entombing of the cinders; and, 3. The embalming of the body. The first of these seems the earliest form on record, and most amply sanctioned by the existing practice of the civilized world. It is the method referred to in the earliest Scriptures (see the touching scene of Abraham's burial of Sarah, Gen. xxiii). The horrible fate of being left unburied, either from scorn or neglect, is powerfully told in the prophecy of Jeremiah against Jehoiakim: 'He shall be buried with the burial of an ass, drawn and cast forth beyond the gates of Jerusalem.'—*Jer.* xxii. 19. There is frequent allusion in the later Scriptures, and especially in the New Testament, to the embalming of the body in antiseptics and fragrant substances; and the burning of the bodies of Saul and his sons is accounted for by commentators on the supposition that they were too far decayed to be embalmed. The Israelites may have learned the practice of embalming from the Egyptians, among whom it was an art so greatly cultivated and extensively practiced that Egyptian corpses, as inoffensive as any article of wood or stone, are scattered over Europe in museums, and are even kept as curiosities in private houses. The soil and climate of Upper Egypt seems to have afforded facilities for embalming unmatched in any other part of the world; and in other places the vestiges of the practice are comparatively rare, though it is usual even yet to embalm royal corpses, and in some places to preserve a series of mummies, as in the vault of the monastery of Kreuzberg, at Bonn, where the monks have been successively preserved in their costume for centuries. The practice of incremation, or of the burning of the body, and the entombing of the ashes, deserves more inquiry than it has yet obtained. In Greece, in Etruria—both before and after it came under the Romans—and in the north of Europe, the simple burial of the body, and its prior reduction to ashes, were both practiced, sometimes contemporaneously. The tombs of Etruria are rich in art, much of it going to the adornment of the urns of baked clay in which the ashes of the dead are kept. Vessels of *terra-cotta*, or baked earth, containing human remains, have been found, often so large that they appear to have served as coffins for containing the whole body. Vessels of this kind were found in the valley of the Scamander by some British officers

after the siege of Sebastopol, upon the ground supposed to have been occupied by the besiegers of Troy. Smaller cinerary urns have been found over so extensive a portion of the world, that it is difficult to define the limits to which they belong. The Danish antiquaries say, that in their stone period, when the use of metals was unknown, the dead were all buried unburned in stone chambers, and that the burning of the bodies and the preservation of the ashes in urns came in with the age of bronze. These antiquaries associate with the older system those amorphous mounds of earth or stone called barrows or tumuli, which are to be found all over the north of Europe. Mr. Bremner, in travelling among the steppes of the Ukraine, saw multitudes of these small mounds, which reminded him at once of what he had seen on the plain of Troy, at Upsala in Sweden, in Scotland, and in Ireland. The Irish tumulus of New Grange is perhaps the most remarkable of all, forming a connecting link between the simple barrow on the moor and the pyramids of Egypt, which are the perfection of the same kind of structure applied to the same purpose—the burial of the distinguished dead. These structures open up a large field of curious inquiry. The simple theory that the earth mounds were raised over the dead has lately been disturbed by the discovery that many of them are not artificial, but relics of sheets of alluvial matter, the mass of which has been carried away; and even in these human remains have been found, the natural mounds having been used as monuments. Even when human remains are connected with barrows, cromlechs, or the large shapeless pillars commonly called Druidical, it is often questionable whether the monument was made to receive such remains. It is certainly ascertained to have been a practice in ancient times to bury bodies in tombs which were themselves ancient when they received their inmates.

Some of the grandest buildings in the world have been tombs; such are the pyramids, the castle of St. Angelo, the tomb of Cæcilia Metella, and many temples scattered over Hindustan and other eastern countries. Thus, the respect paid by the living to the dead has preserved for the world many magnificent fruits of architectural genius and labor. A notion that the dead may require the things they have been fond of in life, has also preserved to the existing world many relics of the customs of past ages. The tombs of Egypt have supplied an immense quantity of them, which have taught the present age more of the manners of ancient nations than all the learned books that have been written. It is an awful evidence of barbarism and superstition, that inanimate things were not all that the dead were expected to take with them. Herodotus tells of favorite horses and slaves sacrificed at the holocaust of the dead chief. The same thing has been done in our own day in Ashantee. In many countries, the wives had the doom, or privilege, as it was thought, of departing with their husbands; and down to the present generation the practice has lived in full vigor in the Hindu sutti. Among the

Jews, the Greeks, the Romans, and many ancient nations, the dead were buried beyond the town. The 'stop, traveller!' was a usual memorandum on Roman tombs. In Christian countries, if the remains of the saint to whom a church was dedicated could be obtained—or anything passing for the remains—they were buried near the altar in the choir. It became a prevalent desire to be buried near these saints, and the bodies of men eminent for their piety, or high in rank, came thus to be buried in churches. The extension of the practice was the origin of churchyards. These, in crowded towns, became offensive and unhealthy. It can scarcely be said that this practice, so detrimental to the public health, as the burial within churches, was checked in Britain until the whole system of intramural interment, as it was called, was attacked, about 1844, by Mr. Chadwick and other sanitary reformers. Measures were afterward carried, beginning 1850, for shutting graveyards in crowded cities, and placing interments in open cemeteries under sanitary control.

In England, burial in some part of the parish churchyard is a common-law right, which may be enforced by mandamus—that is, every person may be buried in the parish where he dies. But the body of a parishioner cannot be interred in an iron coffin or vault, or even in any particular spot of a churchyard, as, for instance, the family vault, without an additional fee. See FUNERAL: CEMETERY: CREMATION.

BUR'IAL SOCI'ETIES: friendly societies constituted in the usual manner, and with the express object of supplying a fund for paying the funeral expenses of the members on their death. See FRIENDLY SOCIETIES.

BURIATS, *boo-rē-äts'* a Mongol people, forming a branch of the Kalmucks, and who submitted to the Russians in 1644. They inhabit the southern part of the government of Irkutsk and Transbaikalia, and number more than 200,000. They support themselves by their flocks, by hunting, and the mechanical arts, particularly the forging of iron. Their dress consists partly of leather. Their religion is partly Lamaism and partly Shamanism; and their idols are sometimes painted on cloth, and sometimes made of wood, metal, felt, and sheepskin.

BURIDAN, *bŭr'ĭ-dn,* Fr. *bü-re-dŏng',* JEAN, b. at Bethune, Artois; 14th c.: scholastic metaphysician of the nominalist party. He studied at Paris under Occam, where he also became a teacher of philisophy. The events of his life, as well as the manner of his death are very obscure. One account states, that he was thrown into the Seine, by command of Marguerite de Bourgogne, daughter-in-law of Philippe le Bel, whose infidelities he had rebuked. Another, later, but less mythical account, states that Buridan was driven from France as a disciple of Occam, and fled to Austria, where he

founded a school. His elucidations of Aristotle are among his most useful writings. In his *Logic*, his great endeavor was to facilitate the discovery of middle terms for all kinds of syllogisms. The celebrated sophism known to the schoolmen under the name of BURIDAN'S ASS, has been discussed at superfluous length, and with needless ingenuity, by Bayle. It is not at all likely that it was ever adduced by Buridan, but more probably by his adversaries, who wished to ridicule his metaphysical doctrine of *Determinism*—viz., that in every mental and bodily action the will must be determined by something out of itself. The sophism referred to is, that if a hungry ass be placed exactly between two bundles of hay of equal size and attractiveness, it must starve, as there is nothing to determine the will of the animal toward either bundle. His chief works are—*Summula Dialectica* (Paris, 1487), *Compendium Logicæ* (Venice, 1489; Oxford, 1637), *In Aristotelis Metaphysica* (Paris, 1518).

BURIN, n. *bū'rĭn*, sometimes called GRAVER [F. *burin* —from It. *borino*, a sharp chisel for cutting stone with: Fin. *purra*, to bite]: an engraver's tool made of tempered steel, of prismatic form, the graving end being ground off obliquely to a sharp point. The style of an engraver is sometimes described by such expressions as *soft* Burin, *graphic* Burin, *brilliant* Burin. BU'RINIST, n. an engraver.

BURITI PALM, *bū-rē'tĭ pâm (Mauritia vinifera:* see MAURITIA): a beautiful palm, abundant in the swamps of some parts of the n. of Brazil. It is one of the loftiest of palms. Its leaves are fanshaped, and form a large globular head at the top of the stem. It produces a great number of nuts about the size of a small hen's egg, covered with rhomboidal scales arranged in a spiral manner. Between these scales and the albuminous substance of the nut, there is an oily reddish pulp, which is boiled with sugar, and made into a sweet-meat. An emulsion also is prepared from it, which sweetened with sugar, is a very palatable beverage, but if much used, is said to tinge the skin yellow. The juice of the stem also makes a very agreeable drink; but to obtain it, the tree must be cut down, when several holes about 6 in. sq., 3 in. deep, and 6 ft. apart, are cut into the trunk with a small ax; and these in a short time are filled with a reddish-colored liquid, having much the flavor of sweet wine.

BURK, v. *bėrk* [from *Burke*, the name of an Irishman who murdered by suffocation to provide subjects for dissectors—was hanged at Edinburgh 1829]: to murder by suffocation; to smother (see ANATOMY, in Law). BURK'ING, imp. BURKED, pp. *bėrkt*. To BURK A QUESTION, to smother or suppress it by unfair means, before it has been fairly discussed.

BURKE, *bėrk*, EDMUND. 1730–1797, July 7; b. Dub-

lin: philosopher and politician, distinguished over all the men of his times for eloquence and political foresight. His father had extensive practice as an attorney. As a schoolboy, he showed those traits of character and the germs of those powers which ultimately gave him greatness. In 1744, Burke entered the Univ. of Dublin, of which he became a scholar. His undergraduate course was not extraordinarily distinguished; he appears to have had for favorite studies, poetry, oratory, history, and metaphysics. In 1784, Feb. he graduated B.A., and in 1751 took his degree as Master of Arts. In the interval (1750), being destined for the English bar, he proceeded to London, to keep his terms at the Middle Temple. To legal studies, however, he never took kindly, and ultimately he abandoned the idea of becoming a barrister. During 1750–56 he appears to have occupied himself in travelling through England, enjoying the society of literary men, in study, and finally in writing for various periodicals.

Burke, when yet at the university, had achieved a local reputation for literary talent and eloquence. Among the compositions of his undergraduate life, the most noticeable, perhaps, is his translation of the conclusion of the second Georgic of Virgil, which shows poetic talent. His first important publication, however, was the celebrated *Vindication of Natural Society* in imitation and ridicule of the style and reasoning of Lord Bolingbroke, in which, with well-concealed irony, he confutes his lordship's views of society by a *reductio ad absurdum*. This work, published anonymously 1756, attracted considerable attention. His age was then 26. In the same year, appeared his well-known essay, *A Philosophical Inquiry into the Origin of our Ideas of the Sublime anl Beautiful*—a work containing a comprehensive induction of the various *sources* of the ideas referred to, but which fails, so far as it attempts to analyze into their primary elements the emotions of the sublime and beautiful.

The essay on the *Sublime and Beautiful* attained rapid popularity and its author soon found himself courted by all the eminent men of his time., Garrick was already one of his friends; among them he soon could count Reynolds, Soame Jenyns, Lord Lyttelton, Warburton, Hume, and Dr. Johnson. Notwithstanding this popularity, however, his progress continued slow; for three years yet, he had to occupy himself with periodical writing, giving his leisure principally to political subjects. What is considered a joint work of Burke and his cousin, William Bourke, appeared 1757—*An Account of the European Settlements in America*—and shows how carefully at this date he had studied the condition of the colonies. In 1761, Mr. W. G. Hamilton ('Single-speech Hamilton'), then sec. for Ireland, having appointed him his private sec., Burke returned to Dublin, where, during two years' service, he demon-

strated his aptitude for political business, receiving, 1763, in reward of his services, a pension on the Irish establishment of £300, which, however, he did not long enjoy.

Returning to London, Burke, 1764, with Reynolds, founded the Literary Club, the history of which is associated with almost every considerable name in the literature of the period. But literary society did not withdraw his attention from the chances of a political career. He became private sec. to the Marquis of Rockingham on his becoming premier, and at the same time entered parliament as member for Wendover. Here his eloquence at once made him the reputation of being 'the first man in the Commons.' The Rockingham administration, however, lived only a few months, and with it terminated his second political employment. Burke's parliamentary life extended 1766 to '94 without intermission; he was successively member for Wendover, Bristol, and Malton; twice held the post of paymaster of the forces, once under Rockingham, and again under Lord North, with the standing of a privy councilor; after a career in parliament remarkable for the laboriousness, earnestness, and brilliancy with which every duty was discharged, and extending over nearly 30 years, he retired at last, receiving the thanks of the commons for his numerous public services, and rewarded by government, on the express request of his sovereign, with pensions amounting in all to £3,700. As paymaster of the forces he, with scrupulous regard to public economy, sacrificed all the perquisites of his office, exhibiting a severe integrity unusual at that period and not general at any time among public men; and in his relation with the constituency of Bristol, which was alienated from him by his advocacy of the claims of the Roman Catholics and of the opening of the trade of Ireland, he was the first to maintain the doctrine of the independence of parliamentary representatives—that they are not machines to vote for measures approved by their constituencies simply for that reason, but men and thinkers chosen by them to calmly consider and legislate for the good of the commonwealth. It must also be mentioned that during his career he rendered more important service to the cause of humanity than any man of his time; he prepared the way for the abolition of the slave-trade, a measure destined to ripen to success in the hands of Wilberforce; he advocated the cause of humanity in India against the voracious greed of stockholders, who regarded its millions simply as materials for plunder, and largely contributed to improve the government of that country. Toward America he advocated a policy of justice and conciliation, which, had it been adopted, would have averted the horrors of the war of independence and retained the colonies in amity with the mother country. And to the advocacy of every cause which he

espoused he brought a capacity for patient research that was unlimited, and an eloquence that has never been surpassed.

As to his literary efforts in connection with his political labors—omitting a variety of valuable letters (several on the condition of Ireland) notice must be taken of his *Observations on a Pamphlet on the Present State of the Nation,* his first political pamphlet, published 1769, in answer to one variously ascribed to Fox or Grenville. In 1770 he published a pamphlet, *On the Cause of the Present Discontents.* 1788, Feb. 13, he commenced his celebrated speech opening the trial of Warren Hastings (q.v.), the most remarkable trial, perhaps, in the history of the world. This speech lasted over four days, and has been characterized as 'a tempest of invective and eloquence.' No idea can be conveyed of the effect which it produced. The trial lasted seven years, and closed with another great and splendid oration from Burke, lasting over nine days. Hastings, it is well known, was acquitted. While this trial was advancing, Burke found time to take part in all the current business. In 1790 appeared his *Reflections on the Revolution of France,* which sold in tens of thousands, and is said to have produced an effect never produced before nor since by any political essay. Hereafter, the world showered honors on Burke, of which space forbids even the enumeration. Having, in 1791, withdrawn from the whigs on the French question, he offered for the consideration of government, *Thoughts on French Affairs,* not published till after his death. *Heads for Consideration on the Present State of Affairs,* and *Reply to a Noble Lord,* next followed, the latter relative to himself personally. His last work, *Thoughts on a Regicide Peace,* showed that he retained to the end of his life his whole powers unimpaired.

Few men have been the subjects of higher panegyric than Burke, and, on the whole, few have better deserved praise. He was noble-minded, pure in his life, and a purist in politics. Intellectually, he was most richly endowed; with much imagination, rare powers of observation, and indefatigable industry, there was no subject which he could not master, and none which. having mastered, he could not expound with unparalleled richness of language. But with these virtues and powers were conjoined defects, which, without bating their greatness, largely neutralized their influence. He was, it may be said, too literary to be a philosopher, and too philosophic to be a politician. His career seems to illustrate this position. His oratory astounded by its brilliancy rather than persuaded by its tone and argument; and in the long-run, the eloquence which failed to command the reason, ceased to captivate the ear. The man who at first evoked the enthusiasm of the House by the brilliancy and power of his eloquence, did actually at last empty it by persistence in the

monotonous splendors of his speeches. Passionate, and in a great degree untractable, he was unsuited for party politics, and drifted from all his connections, breaking up slowly all party ties, and even the ties of friendship, till he reached at last a state of almost political isolation. At the same time, it must not be forgotten how great an influence he, half philosopher, half politician, exercised on the counsels of the state; many of his views on politics and public economy were anticipations of science, as many of his previsions of the course of events were prophecies.

Burke died in his 68th year. His Speeches were published in 4 vols. (1816), his Works in 16 (1803–27); and his Correspondence in 4 (1844). See the Lives by Prior (4th ed. 1854), Macknight (1861), Morley (1867 and '79), and Robertson (Dublin, 1876).

BURKE, John, Irish genealogist: b. near Parsontown, Ireland, 1786; d. Aix la Chapelle, 1848, March 27. In 1826 he began to publish a *Genealogical and Heraldic Dictionary of the Peerage and Baronage of the British Empire* and subsequent works by him were: *A Genealogical and Heraldic History of the Commoners of Great Britain and Ireland* (1833–8), which in subsequent editions appeared as *A Dictionary of the Landed Gentry.*

BURKE, Sir John Bernard, English herald and genealogist: b. London, 1815; d. Dublin, 1892, Dec. 13. He was educated at Caen in Normandy, was trained as a lawyer and called to the bar in 1839. Besides editing the successive issues of the *Peerage* founded by his father (49th ed. 1887), he published other works on the *Landed Gentry* (1846); *Extinct Peerages* (1846); *Anecdotes of the Aristocracy* (1849); *Family Romance* (1853); *The Vicissitudes of Great Families* (1859); *The Rise of Great Families* (1873); *The Book of Precedence* (1881); and *Reminiscences* (1882).

BURKE, John Masterson, American banker and philanthropist, of Irish parentage: b. New York, 1812, July 2. His early education was obtained at a private school and at the age of 12 he became a clerk in a woolen house in his native city, accepting a position of trust in a steel and iron foundry four years later. While there he studied mechanical engineering and subsequently went to Yucatan as engineer of a cotton factory there, remaining seven years. Returning to New York, he became some years later the chief member of the firm of Ponvert & Company, sugar and commission merchants. In 1902, July, he transferred real and personal property to the amount of $4,000,000 to a corporation, called in honor of his mother, the 'Winifred Masterson Burke Relief Foundation.' The purpose of the corporation is to be the relief of worthy men and women who have become partly or wholly unable to work by reason of sickness or misfortune, or who

have been discharged from hospitals before regaining sufficient strength to resume their regular employments.

BURKE, Maurice, Francis, American clergyman: b. Ireland, 1845, May 5. He came to the United States in childhood and was educated in Chicago and Notre Dame, Ind., and in the American College, Rome, where he was ordained to the Roman Catholic priesthood in 1875. Returning to the United States, he took charge of a parish in Joliet, Ill. In 1887 he was consecrated bishop of Cheyenne, Wyo., and in 1893 was transferred to the see of St. Joseph, Mo. Bishop Burke is known as a fine linguist.

BURKE, Thomas Martin Aloysius, American clergyman: b. Ireland, 1840, Jan. 10. He came in childhood to Utica, N. Y., and was educated in Toronto and Baltimore and was ordained to the Roman Catholic priesthood in 1864. He was appointed to labor in Albany and became successively vicar-general and administrator. In 1894 he was consecrated bishop of Albany.

BURKE, Thomas Nicholas ('Father Tom'): Roman Catholic priest and lecturer: 1830, Sep. 8—1883, July 2; b. Galway, Ireland; son of a confectioner. While a lad he was sent to Rome, studied there for the priesthood, was ordained in England, and performed his first priestly duties for four years in the city of Gloucester. He was then sent to Dublin, and founded the novitiate and school of the Dominican Order at Tallaght, a neighboring village, Later, he returned to Rome, and for a time filled the pulpit of Cardinal Manning in the Church of Santa Maria del Popolo, developing remarkable power as an orator. In 1871 Father Burke came to the United States in the capacity of visitor-gen. of the houses of the Dominican Order. Here he became noted for his attack, in public lectures, on James Anthony Froudes' work on *Ireland in the Eighteenth Century.* The latter years of his life were passed in Ireland. He died at the Tallaght convent.

BURL, v. *bĕrl* [F. *bourlet,* a pad—from *bourre,* hair, flock: prov. F. *bouril,* a flock or end of thread which disfigures cloth: Sp. *borla,* a tuft]: to pick knots and loose threads from cloth when fulling it. Burl'er, n. one who dresses cloth. Burl'ing, imp. Burled, pp. *bèrld.* Burl'ing-iron, n. an instrument like large tweezers used in clearing cloth of knots, ends of thread, and the like.

BURLAP, n. *bĕr'lăp*: a coarse heavy fabric for wrapping, made of jute, flax, manilla, or hemp; a finer kind is used in upholstering.

BURLEIGH, William Cecil, Lord: see Cecil.

BURLESQUE, n. *bĕr-lĕsk'* [F. *burlesque*—from It. *burleseo,* comical, facetious—from It. *burlare,* to make a jest of; comp. Gael. *buirleadh,* the language of mockery or ridicule]: the turning any matter into ridicule; the

representation of a subject in mock gravity with the view of exciting laughter: ADJ. tending to raise laughter; droll; comic: V. to turn a subject into ridicule; to treat a trifling matter with mock gravity to excite laughter. BURLES'QUING imp. *-kĭng*. BURLESQUED', pp. *-lĕskt'*. BURLES'QUER, n. *-lĕs'ker*, one who. BURLESQUE'LY, ad. BURLETTA, n. *-lĕt'tă* [It.]: a comic opera or operetta; a musical farce.—SYN. of 'burlesque, n.': parody; satire; travesty; irony; sarcasm; caricature; comely; humor; wit.

BURLESQUE': a low and rude grade of the comic style, in speaking, acting, writing, and drawing. The legitimate comic brings together contrasts with a final view to harmonizing and reconciling them; the burlesque distorts and caricatures, and brings the incongruities into stronger relief. The farce is the Burlesque of comedy. Deformities and monstrosities that excite disgust do not belong to the burlesque. The lofty and the abject, the great and the little, are conjoined, with the sole view of exciting a laugh. Nor does the true Burlesque turn real greatness and nobility into laughter, but only sham greatness—false pathos, and all hollow pretension and affectation. The Burlesque style appears to have been unknown to the ancients; it originated among the Italians, particularly with the poet Berni (q.v.). The genuinely national *buffone* of the Italians personates the burlesque. Carlo Gozzi, in his tragi-comedies, is perhaps the greatest in the Burlesque vein. Scarron among the French, and *Hudibras* in English, are examples. Parody (q.v.) or Travesty (q.v.) is a species of burlesque. See FARCE.

BURLETTA, n. *bĕr-lĕt-ta* [Ital.]: a light comic opera.

BURLING, GILBERT: 1843–75: American painter, one of the founders of the Society of Painters in Water-colors. He painted almost exclusively in oil-colors at the commencement of his career, but abandoned these for the water-colors, as better adapted to his style. His later works were considered the best, among which the *Beach below Easthampton* and *Normandy Sketches* were the most notable.

BURLINGAME: *bĕr'lĭng-gam:* township of Osage co., Kan., 27 m. s.w. of Topeka, on the Topeka and Santa Fé railroad. It has several mills, and coal mining and the manufacture of pottery are among its industries. Pop. 1,673.

BURLINGAME, ANSON, LL.D.: 1820, Nov. 14—1870, Feb. 22; b. New Berlin, N. Y.: diplomatist. When a boy he lived on a farm with his parents in Rhode Island, Ohio, and Michigan. He entered the Univ. of Michigan, 1837, and in 1843 the Law School of Harvard Univ., graduating 1846. He began to practice law in Boston, became prominent in politics as a free soiler, and in 1852 was elected to the Massachusetts senate.

In 1854 he joined the American party, by which he was elected to congress, and in the following year he was one of those who formed the republican party. In congress he was an able anti-slavery orator and debater, and became prominently known on account of his challenge by Preston S. Brooks for his comments on the assault by the latter on Senator Sumner. The challenge was accepted by Mr. Burlingame, and Navy Island, Canada, named as the place. Brooks objected, and the affair fell through. He continued to be re-elected to congress till 1861, when he failed of election, but was appointed, by President Lincoln, minister to Austria. Objection being raised by that country to the appointment, because of Burlingame having favored Hungarian independence, he was sent as minister to China. In 1867 he intended to resign his position, but had made himself so much respected by the Chinese government, that Prince Kung appointed him special envoy to the United States and the great western powers, to form treaties with those nations. This duty was accepted by Mr. Burlingame, and he arrived in the United States, 1868, Mar., accompanied by a numerous retinue of distinguished Chinese officials. Through his influence what is known as the Burlingame Treaty was effected between the United States and Chinese governments. Mr. Burlingame prosecuted his diplomatic mission in England, France, Denmark, Sweden, Holland, and Prussia, negotiating important treaties with all those countries excepting France. Arriving at St. Petersburg, 1870, he was suddenly seized with a severe attack of pneumonia, which carried him away after an illness of a few days. Mr. Burlingame was a man of fine culture, of wide understanding, and possessed a peculiarly courteous and agreeable manner which everywhere won him friends.

BURLINGAME, Edward Livermore, an American editor, son of Anson Burlingame (q.v.): b. Boston, 1848, May 30. He studied at Harvard, but left before graduation; acted as private secretary to his father, who was United States minister to China; from 1867–9 was a student in Heidelberg University; and from 1869–71 travelled extensively. He was connected editorially with the *New York Tribune* in 1871, and from 1872–6 was a member of the staff for the revision of Dana and Ripley's *American Cyclopædia*. Since 1879 he has been associated with the publishing house of Charles Scribner's Sons, and in 1886 became editor of *Scribner's Magazine*.

BURLINGTON: city, cap. of Des Moines co., Ia., 160 m. from Des Moines, 200 from Chicago, 220 from St. Louis, 260 from Kansas City, 290 from Omaha and 350 from St. Paul; in a fine natural amphitheatre formed by the limestone bluffs on the west banks of the Mississippi river. These banks rise gradually for several blocks, upon which is built the business portion

of the city; while upon the bluffs beyond are the principal residences. The river is broad, deep, and clear, and as the summits of the bluffs are planted with orchards and vineyards the scene is very attractive. Unexcelled schools, the purest water, ample sewerage, spacious lawns, beautiful parks, attractive homes and churches, a splendid street railway system, a finely equipped public library, a coliseum, and four daily papers, make the city attractive as a residence and social centre. Burlington is a place of great commercial importance, having unusual transportation facilities by both rail and river. Six extensive railway systems reach the city, and it has direct communication with every river town from St. Paul to New Orleans. Extensive and valuable coal fields are near enough to encourage factories of all kinds. Burlington had in 1905, 109 manufactoring establishments with a capital of $5,030,596, employing 3,237 ersons at a cost of $1,730,089, value of products $5,779,337. The town was laid out in 1834 and incorporated in 1837 when the capital of Wis. Ter. was removed here. Two sessions of the Wis. territorial assembly were held here, and later three sessions of the Iowa territorial assembly, before the capital was removed to Iowa City in 1840. Population (1910) 24,324.

BURLINGTON: city and county-seat of Coffey County, Kansas; on the Neosho River, and on the Atchison, Topeka and Santa Fé and the Missouri, Kansas and Texas railroads; 60 miles south of Topeka. It is in the centre of an important agricultural and stock-raising region, has several flour mills and other industrial establishments and is supplied with good water-power. Pop. 2,700.

BURLINGTON, N. J.: a city and port of entry in Burlington co., on the Delaware River and the Pennsylvania R. R.; 18 m. n.e. of Philadelphia. It is a manufacturing trade centre for surrounding towns, and contains St. Mary's Church, endowed by Queen Anne; St. Mary's Hall, the oldest church school for girls in the country; the State Masonic Home; Burlington College, and many fine old residences; and has manufactories of shoes, stoves, iron pipe, terra-cotta, and canned goods. The city was settled in 1677, by Friends, under the name of New Beverly. The name was subsequently changed to Bridlington, in honor of the Yorkshire town of that name on the North Sea, commonly called Burlington, and the spelling was presently made to accord with the pronunciation. The city was for many years the seat of government of West Jersey; and was the residence of the last colonial governor, William Franklin. It was bombarded by the British in 1776. Pop. (1900) 7,394; (1910) 8,336.

BURLINGTON: port of entry, largest city of Vt., capital of Chittenden County, on Burlington Bay, an

arm of Lake Champlain. It was founded 1783, incorporated 1864. Its location is charming, being on elevated ground, 300 feet above the lake, 1½ m. w. of the Winooski river, about 70 m. n. of Whitehall, and 40 m. w.n.w. of Montpelier. Several branches of the Vt. Central railroad give it direct communication with all points n., e., and s. Steamboats connect it with all important points on the lake, and the sail affords picturesque views. The more elevated portion of the city also commands magnificent views of the Adirondack mountains beyond the lake, and of beautiful scenery in all directions. A fine court-house, the post-office, and a number of the principal hotels are built around a public square, near the centre of the city. The city contains many tasteful residences. It has an excellent harbor, improved by a break-water constructed by the U. S. government. The light house stands on Juniper Island. The Univ. of Vermont, founded 1800, and open to both sexes, is located on a beautiful eminence nearly 300 ft. above the lake. B. is the seat of a Rom. Cath. bishopric, of a Prot. Epis. bishopric, and has the Vt. Episcopal Institute, a free library of 12,000 volumes, an orphan asylum, a hospital founded by Miss Mary Fletcher (erected at a cost of $175,000), the custom-house, etc. Col. Ethan Allen, of Revolutionary fame, is buried here under a handsome monument in Greenwood Cemetery. It is one of the largest lumber markets in the country. There are large planing mills, machine-shops, and extensive manufactories of lumber, flour, cotton, furniture, carriages, steam fire-engines, doors and blinds, stoneware. Pop. (1900) 18,640; (1910) 20,463.

BURLINGTON: township of Racine co., Wis., on the Western Union railroad, about 34 m. s.w. of Milwaukee, on the Fox river. It has two foundries, a woolen mill, and manufactories of wagons and agricultural implements; also a state and a national bank, five churches, and a high school. Pop. (1910) 3,212.

BURLINGTON LIMESTONE: valuable building stone, abundant in the neighborhood of Burlington, Iowa, and in different localities along the Mississippi river. It is remarkable for the great mass of fossils contained in it, the crinoidea and corals being particularly abundant. It occurs generally in double layers, the upper consisting almost entirely of carbonate of lime, while the lower contains magnesia.

BURL'TON, Peter Henry: 1804–29: English explorer, who was killed in India, while making scientific researches there.

BURLY, a. *bēr'lĭ* [Ir. *borram*, to grow big and prosperous: Gael. *borr*, swelling, strong; *borrail*, swaggering, haughty: Scot. *buirdly*, stout and strong]: big and fresh-looking; big and honest but not refined; stout and jolly; big and blustering. Bur'liness, n. *-lĭ-nĕs*, the being big, fresh, and honest-looking; the being big and blustering. Hurly-burly, n. confusion; uproar.

BURMAH.

BURMAH, *bèr'mâ*, EMPIRE OF; called also the EMPIRE OF AVA: till 1885 an independent kingdom of the Indo-Chinese peninsula. Formerly it was of great extent; but by two contests with the British power in India, it lost several provinces, until, in its widest sense and including tributary states, it was comprehended between 19° 29′ and 28° n. lat., and 93° and 100° e. long.; about 175,500 sq. m. Pop. estimated 4,000,000. It was bounded on the n. by mountains, separating it from Assam and Tibet; on the e., by China; on the s. by the British province of Pegu; and on the w., by Munnipore and mountain-ranges dividing it from Tipperah, Chittagong, and Aracan. The Burman empire, thus defined, had three well-marked divisions: 1. Northern B., inhabited chiefly by Singphos, Shans, and other tribes; 2. B. proper; 3. The Eastern Shan tributary states. The area of B. proper, from lat. 24° n. to the frontier of Pegu, is 44,450 sq. m. Pop. about 1,200,000.

Physical features.—From the e. extremity of the great transverse mountain-barrier of n. India, longitudinal ranges strike away southward, and between two of these are the Burman territories. The country slopes from the high-land regions of the n. toward the coast, and is fitly described as 'a varied surface of rolling upland, interspersed with alluvial basins and sudden ridges of hill.'

The principal river, the Irrawaddy (q.v.), having its source amid the snowy mountains from which descends the Brahmaputra, is the great commercial highway of the country, through the heart of which it takes its course. Passing Amarapura, Ava, and other towns, it enters Pegu, and, 90 m. below Prome, divides into an e. and w. branch, the former flowing past Rangoon, the latter forming the Bassein river. The Kyen-dwen is its principal tributary. To the e. of the Irrawaddy, the Salween, after an almost parallel course, enters the British territories in nearly the same latitude.

Climate.—On the coast, only two seasons are known—the dry and the rainy, which are regulated by the n.e. and the s.w. monsoons; but in B. proper, less rain falls, and there are three seasons—the cold, the hot, and the rainy. Some showers fall in May or June, but the great rains last from the middle of Aug. to the end of Oct. The cool season is from the middle of Oct. till the beginning of April, and from this month till the great rains is the hot part of the year, the thermometer ranging 85° to 100°. The climate is, on the whole, healthful, but the jungles are very pestiferous.

Minerals.—B. has vast fields of mineral wealth; but little enterprise and capital are brought to bear upon them. There are gold mines at Bamo, near the Chinese frontier. Auriferous sand is found in many streams. Silver is obtained at Bau-dwen, likewise on the confines of China, also in the Shan country, whence comes the chief supply of lead. Iron is quarried at Poukpa, a lofty mountain a few miles e. of Pagan. The celebrated ruby mines of B. are 60 or 70 m. n.e. from the capital, and are jealously guarded. Sapphires of great size are found in the same stratum, but

are more rare. The annual value of the gems is estimated at from $60,000 to $75,000, and they are the property of the king. Wells of petroleum are worked at Ye-nan-gyoung, on the Irrawaddy, above Prome. Marble, noble serpentine, and amber are in large quantities.

Vegetable productions.—A few only of the most striking of these can be noticed. Of the graceful palm-tribe (*Palmaceæ*), the coccao-nut, the betel, the palmyra, and the nipa, or water-palm, are most prized. The useful bamboo is widely diffused. The teak, of which B. has inexhaustible forests, and the hopæa, are among the most valuable timber-trees. Forests of pine grow e. of Amarapura. The wood-oil tree is found on the higher Salween, one trunk of which will produce from 30 to 40 gallons of oil every season. The staple fruit of the country is the plantain or banana. The jack is prized by the natives. The mango reaches the height of 100 ft., and produces delicious fruit. Rice, wheat, tobacco, indigo, and cotton are cultivated.

Animals.—The *Felidæ*, or cat family, abound, tigers, leopards, and tiger-cats being met with in every part of the country. Of the *Pachydermata*, the elephant and rhinoceros are most noteworthy. The elephant, buffalo, and Indian ox have been domesticated.

Ethnology.—The Burmans belong to that branch of the Mongolidæ characterized by a monosyllabic language; they are short-headed, broad-skulled, and flat-faced. The hair is black, and the skin of a deep-brown color. Their *dress* is simple, but peculiar. The *in-gie*, a white linen jacket, is common to both sexes. Wrapped round the lower part of the body, the men wear the *put-so*, which is several yards in length; the women, the *te-mine*, a scant garment of cotton or silk. Silks, muslins, and valuable gold ornaments are worn on especial occasions. Betel-nut chewing and cigar-smoking are greatly practiced by both men and women. The Burmans are, generally speaking, fine, well-made men, and excel in wrestling, boxing, rowing, football, and other athletic exercises; they are clever as carpenters and smiths. Burman houses are made of a framework of bamboo, thatched with the leaf of the water-palm, and are invariably raised on posts several ft. from the ground. The women are more industrious than the men; they buy, sell, weave, and attend to the domestic concerns. Both sexes delight in merry-making, feasting, buffoonery, and sight-seeing. A *pooay*, or theatrical representation, is a favorite amusement, and a buffalo-fight attracts crowds of spectators. The Burman has little patriotism, but is attached to his home. Without individual cruelty, he is indifferent to the shedding of blood by his rulers. Though temperate and hardy, he dislikes discipline and continued employment; and when in power, is often arrogant, arbitrary, and corrupt.

Besides the true Burman, a great variety of races inhabit the Burman territories. The *Telaings*, or *Moans*, descendants of the ancient Peguans, are amalgamated with the Burmans. The *Shans*, or *Tai*, perhaps the most numerous and widely diffused of the Indo-Chinese peoples, are scat-

tered over the peninsula, from Munnipore to Bangkok. Of the eastern Shan states some are tributary to B., others to Siam, while those w. of the Irrawaddy are wholly under Burman rule. The *Singphos* cluster round the mountains of the n., and along the w. mountain boundary of Burmah wild *Kyhens*, and many tribes under different names, live in varying low degrees of civilization. The *Karens* are chiefly in southern Burmah.

Religion.—Buddhism is the prevailing religion of B. and has here been preserved in its original type. Its monuments—temples, shrines, and monasteries—are innumerable; its festivals are carefully observed, and its monastic system is fully established in every part of the kingdom. For the doctrines and history of this system, see BUDDHISM.

The members of the monastic fraternity are known in B. as *pon-gyees*, meaning 'great glory;' but the Pali word is *rahan*, or holy man. The pon-gyees are not priests, but rather monks. Their religious ministrations are confined to sermons, and they do not interfere with the worship of the people. They are a very numerous class, living in monasteries, or *kyoungs*, and may at once be known by their yellow robes (the color of mourning), shaven heads, and bare feet. They subsist wholly by the charity of the people, which, however, they well repay by instructing the boys of the country. The kyoungs are thus converted into national schools. The vows of a pon-gyee include celibacy, poverty, and the renunciation of the world; but from these he may at any time be released, and return to a secular life. Hence, nearly every youth assumes the yellow robe for a time, as a meritorious act, or for the purpose of study, and the ceremony of making a pon-gyee is one of great importance. The ostensible object of the brotherhood is the more perfect observance of the laws of Buddha. The order is composed of five classes—viz., young men who wear the yellow robe and live in the kyoungs, but are not professed members; those on whom the title and character of pon-gyees have been solemnly conferred with the usual ceremonies; the heads or governors of the several communities; provincials, whose jurisdiction extends over their respective provinces; and lastly, a superior general, or great master, who directs the affairs of the order throughout the empire.

No provision is made for religion by the government, but it has liberal support from the people. A pon-gyee is held in profound veneration; his person is sacred, and he is addressed by the lordly title of *pra* or *phra;* nor does this reverence terminate with his death. On the decease of a distinguished member, his body is embalmed, while the limbs are swathed in linen, varnished, and even gilded. The mummy is then placed on a highly decorated cenotaph, and preserved, sometimes for months, until the grand day of funeral. The Burman rites of cremation are very remarkable. On the whole, an opinion in a certain sense favorable may be passed on the monastic fraternity of B.; though abuses have crept in, discipline is more lax than

formerly, and many doubtless assume the yellow robe from base motives.

In B., the last Buddha is worshipped under the name of Gautama. His images crowd the temples, and many are gigantic. The days of worship are at the new and full moon, and seven days after each; but the whole time, from the full moon of July to the full moon of October, is devoted by the Burmans to a stricter observance of the ceremonies of their religion. During the latter month, several religious festivals take place, which are so many social gatherings and occasions for grand displays of dress, dancing, music, and feasting. At such times, barges full of gaily-dressed people, the women dancing to the monotonous dissonance of a Burman band, may be seen gliding along the rivers to some shrine of peculiar sanctity. The worship on these occasions has been described by an eye-witness, 1857, as follows: 'Arrived at the shrines and temples the people suddenly turn from pleasure to devotion. Men bearing ornamental paper-umbrellas, fruits, flowers, and other offerings, crowd the image-houses, present their gifts to the favorite idol, make their *shek-ho*, and say their prayers with all dispatch. Others are gluing more gold-leaf on the face of the image, or saluting him with crackers, the explosion of which in nowise interferes with the serenity of the worshippers. The women for the most part remain outside, kneeling on the sward, just at the entrance of the temple, where a view can be obtained of the image within.' On another occasion, we read: 'The principal temple being under repair, was much crowded by bamboo scaffolding, and new pillars were being put up, each bearing an inscription with the name of the donor. . . . The umbrellas brought as offerings were so numerous, that one could with difficulty thread a passage through them. Some were pure white, others white and gold, while many boasted all the colors of the rainbow. They were made of paper, beautifully cut into various patterns. There were numerous altars and images, and numberless little Gautamas; but a deep niche or cave, at the far end of which was a fat idol, with a yellow cloth wrapped round him, seemed a place of peculiar sanctity. This recess would have been quite dark, had it not been for the numberless tapers of yellow wax that were burning before the image. The closeness of the place, the smoke from the candles, and the fumes from the quantity of crackers constantly being let off, rendered respiration almost impossible. An old pon-gyee, however, the only one I ever saw in a temple, seemed quite in his element, his shaven bristly head and coarse features looking ugly enough to serve for some favorite idol, and he seemed a fitting embodiment of so senseless and degrading a worship. Offerings of flowers, paper ornaments, flags, and candles were scattered about in profusion. The beating a bell with a deer's horn, the explosion of crackers, and the rapid muttering of prayers, made up a din of sounds, the suitable accompaniment of so misdirected a devotion.'

The rosary is in general use, and the Pali words *Aneit-*

ya! doka! anatta! expressing the transitory nature of all sublunary things, are often repeated. The Burman is singularly free from fanaticism in the exercise of his religion, and his most sacred temples may be freely entered by the stranger without offense; indeed, the impartial observer will hardly fail to admit that Buddhism, in the absence of a purer creed, exerts some influence for good in the country under consideration, teaching man to combat and master his passions, and to exalt mind over matter.

The sacred edifices are of three kinds: The tope, dagoba, or *shrine* (*Zadee* or *Tsa-dee*), a monument to the last Buddha, is a solid, bell-shaped mass of plastered brickwork, tapering to the summit, which is crowned by the *tee*, or umbrella, of open ironwork. 2. The *temple*, in which are many images of Gautama. The most remarkable specimen of Burman temple architecture is the *Ananda* of Pagan. The ground plan has the form of a perfect Greek cross; and a tapering spire, with a gilded tee at the height of 168 ft. from the foundation, crowns the whole. 3. The *kyoung* or monastery (*vihara*) is generally constructed with a roof of several diminishing stages, and is often elaborately adorned. Burman architecture 'differs essentially from that of India in the frequent use of the pointed arch; not only for doors and windows, but also in the vaulted coverings of passages.'

Christian missions have been carried on with great devotedness in B., and begin of late years to show gratifying results.

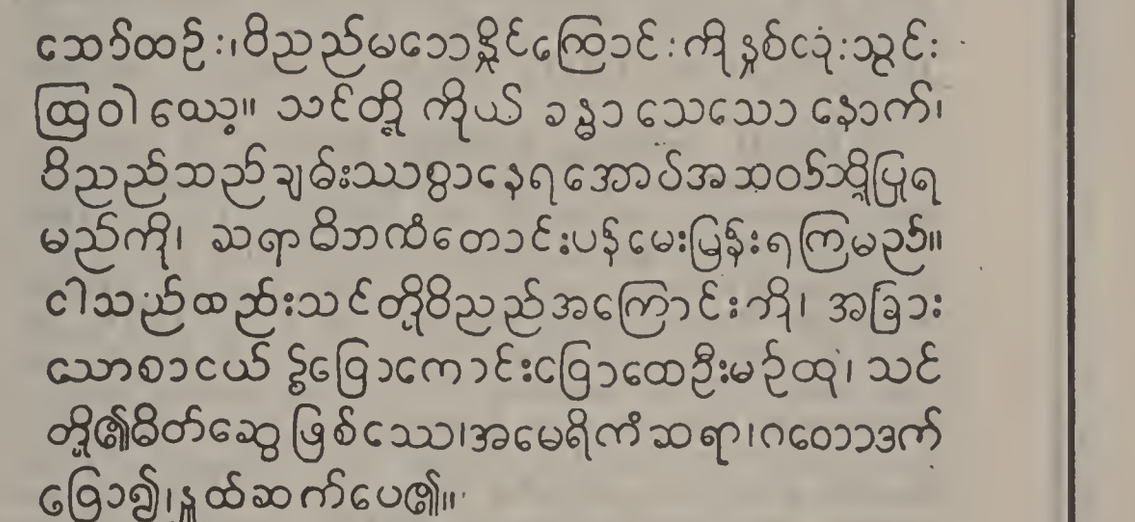
Cities.—Rangoon is the headquarters of the chief commissioner: pop. (1901) 234,881. Mandalay, former cap. of Upper B., is laid out in three parallelograms, one within another, of which the inner two are walled; the palace occupies the centre; pop. (1901) 183,816. Ava and Amarapura, each at one time the cap. of the empire, are now almost deserted. Pagan represents the past of B., and is remarkable for its magnificent ruins of temple architecture, extending over 8 sq. m.; the prevailing type is the cruciform vaulted temple.

Government.—The government of B. was a pure despotism, life and property being at the mercy of the reigning sovereign. Many instances of the cruel abuse of arbitrary power might be given. Thus the late king, Thebaw, inaugurated his accession, 1878, by the murder of a hundred relatives and other possible rivals. The *Lot-dau* or High Court of Council, was composed of the four *woon-gyees*, or principal ministers of state. The *atwen-woons*, or household ministers, were likewise four in number. They received the royal commands, and were in close attendance upon the king. The *woon-douks* were a third order of ministers, and acted as assistants to the woon-gyees. The decisions of the lot-dau, when sanctioned by the king, became law. The *Dam-a-that*, a Burman translation of the *Institutes of Menu*, was also in force. White umbrellas and white elephants were regarded as insignia of royalty. The 'Lord White Elephant,' indeed, was looked on as an

estate of the realm, a mark of universal sovereignty, and a sacred being. It had a palace, a minister, and numerous attendants.—The *military power* of the country was not great, its army of 30,000 men being mainly an undrilled rabble, armed with old rusty muzzle-loaders.

The *civilization* of B., if not retrograde—which the ruins of Pagan suggest—is stationary and stereotyped, like that of China. All the wealth of the country is lavished on the sacred edifices, $50,000 being sometimes expended on the gilding and beautifying of a single shrine or temple, while roads, bridges, and works of public utility are neglected.

The *vernacular tongue* of B. belongs to the monosyllabic class of languages and is without inflection; the character is formed of circles and segments of circles. It is engraved on prepared strips of palm-leaf, and a number of these form a book. Printing is unknown except where intro-



Specimen of Burmese Writing.

duced by the missionaries. *Pali* is the language of the religious literature.

Commerce.—Since B. was deprived of its harbors and maritime districts, its foreign commerce has been very limited. The principal exports (from B. proper) consist of Sesamum oil, teak-timber, petroleum, sweet-oil, tobacco, lacquered boxes, gold-leaf, silver, lead, copper, stick-lac, indigo, cocoa-nuts, ponies, wheat, pulse, and cotton. The imports (into the Burman empire) are *ngapee* (a paste of rank pickled fish, eaten with rice, the staple food of the Burman), paddy, rice, dried fish, salt—all these being imported by thousands of tons annually—cotton piece-goods, silk piece-goods, and woolens. B. has overland traffic with China, exporting cotton and importing silk.

History.—Of the early and mythical history of B., nothing need here be said. The kingdoms of Ava and Pegu long contended for mastery. The latter was in its zenith about A.D. 1580. In 1752, the Peguans, after a period of subjection, had obtained the advantage: but

Alompra, or *Aloung Pra*, the most celebrated warrior-king in Burman history, rose to power, subdued the Peguans, and incorporated their country, as well as many neighboring states, with his own. The Burman empire was greatly curtailed by the wars of 1822–24 and 1852 with the British. The half-drunken, half-crazy excesses of young King Thebaw led 1879, to the withdrawal of the British resident; and in 1885, his attacks on the interests of British subjects in Burmah called forth an ultimatum from Lord Dufferin, the Indian viceroy. On Thebaw's refusal to treat, an expedition under General Prendergast advanced up the Irrawaddy, and meeting with slight opposition, occupied Mandalay, 1885, Nov. 28. Thebaw's deposition and removal to India were followed, 1886, Jan. 4, by the British annexation of Burmah. Pop. (1901) Upper Burmah, 3,849,833; Lower Burmah, 5,389,897. See Yule's *Narrative of the Mission in* 1855; Fytche's *Burmah, Past and Present* (1878); *The Burman: his Life and Notions*, by Shway Yoe (1882); Vincenti's *Land of the White Elephant* (1874); Phayre's *History of Burmah* (1883).

BURMAH, British: maritime province of India beyond the Ganges. The three divisions of Aracan, Pegu, and Tenasserim, united in one administration in 1862, are now four, Pegu having been subdivided and a new division, Irrawadi, created. British Burmah extends along the Bay of Bengal from 20° 50′ n. lat. to 10° 15′, with a coast-line of about 90 m. area, 87,220 sq. m. The whole of this territory was taken from the king of Burmah in the two wars provoked by him. For areas and populations of the several divisions, see Tenasserim; which see, as also Pegu and Aracan, for the climate and productions of British Burmah. Akyab (q.v.), Rangoon (q.v.), and Moulmein are the principal ports of Aracan, Pegu, and Tenasserim respectively. The Burmans (including Aracanese and Taleins or Peguens), number about two millions. Other races are Karens, Shans, Chinese, and Hindus. Pop. of British Burmah (1901) 10,490,624.

BURMAN, a. *bėr'măn*, or Burmese, a. *bėr-mēz'*: belonging to Burmah, a country of s.e. Asia. Burmese', n. *-mēz'*, a native of Burmah.

BURMANN, *bûr'mân*, Peter: 1668–1741, Mar. 31; b. Utrecht: most important member of a Dutch family celebrated for learning. He studied law at the univ. of that city and of Leyden, and, after taking his degree 1688, travelled through Germany and Switzerland. After practicing as an advocate for some years, he was appointed prof. of history and rhetoric in the Univ. of Utrecht; which office he exchanged for the professorship of Greek. In 1715, after the death of Perizonius, he removed to the Univ. of Leyden, where he died.

His literary career was very active, and his hot temper

and intolerant spirit involved him in many controversies. Among his most distinguished adversaries were Le Clerc and Bentley. His chief works are editions of the Latin classics—Petronius, Velleius, Paterculus, Quintilian, Valerius Flaccus, Phædrus, Ovid, the Poëtæ Minores, Suetonius, Lucan. The first of these appeared 1709, and the last 1740. They are characterized less by taste and critical acumen than by learning, fulness of matter, and beauty of type.

BURN, n. *bērn* [AS. *byrnan*, to burn: Goth, *brinnan:* Dut. *branden:* Ger. *brennen:* Icel. *brenna*]: an injury to the flesh by the action of fire: V. to injure by fire; to reduce to ashes by the action of fire; to harden by fire; to scorch, as the clothes; to be on fire; to shine; to rage with violence or passion; to feel excess of heat in the body. BURN'ING, imp.: ADJ. very hot; scorching; powerful: N. the act of reducing to ashes; a fire; the vehemence or raging of passion. BURNED, or BURNT, pt. and pp. *bėrnd, bėrnt.* BURN'ER, n. the small movable part of a lamp or gas lustre, etc., next the flame. BURNING-BUSH, the bush of Ex. iii. 2–4; the Artillery plant, *Pilea serphyllifolia; Euonymus atropurpureus,* and *E. Americanus.* BURNING-GLASS, n. a convex lens of glass for collecting the rays of the sun so as to produce heat (see HEAT: LENS: MIRROR). BURNING-MIRROR, n. a concave surface, usually of polished metal, for the same purpose. TO BURN ONE'S FINGERS, to get into trouble by injudicious interference in the affairs of others, or by entering rashly into speculations, and the like. TO BURN OUT, to obliterate by burning; to cease burning when the fuel is exhausted. TO BURN UP, to consume entirely.—SYN. of 'burning, n.': fire; flame; combustion; conflagration; blaze; inflammation;—of 'burning, a.': ardent; fiery; hot; scorching.

BURN, n. *bėrn* [Goth. *brunna;* Icel. *brunnr;* Ger. *born,* a well, a spring: Gael. *burn,* water]: in *Scot.,* a brook; a small running stream.

BURN, RICHARD: 1720–85; b. at the village of Winton, Westmoreland, England. After being educated at Queens College, Oxford, he received the living of Orton, in his native county, which he continued to hold till his death. He is known as the compiler of two very useful lawbooks, the *Justice of the Peace* and *Ecclesiastical Law,* which have each passed through many editions. He also published a *History of the Poor-laws,* and edition of Blackstone's *Commentaries,* and several sermons and works of a religious nature.

BURNABY, FREDERICK GUSTAVUS: 1842–85: British officer, lieut. col. of the Royal Horse Guards Blue in 1881; noted for his extraordinary and daring travels through S. America, central Africa, and other countries, and especially for his wonderful 'Ride to Khiva,' 1875, of which he wrote an exciting narrative. In 1876 he travelled through Asia Minor and Persia, and was in

the army of Don Carlos in Spain as correspondent of the London *Times*. Later he was in the expedition to the Eastern Soudan and was severely wounded in the battle of El Tib. He was also with the Nile expedition force 1884 under Sir Herbert Stewart, and in the first battle, that of Abu Klea, was killed by an Arab spear. Burnaby was noted as an intrepid arëonaut. In 1882 he crossed the English Channel in the balloon 'Eclipse,' landing in Normandy. He wrote besides *A Ride to Khiva, On horseback Through Asia Minor* (1877), and *A Ride across the Channel* (1882).

BURNAP, George Washington, American Unitarian clergyman: b. Merrimack, N. H., 1802; d. 1859. He was graduated at Harvard College in 1824, and in 1827 he was ordained pastor of the First Independent Church in Baltimore, where he remained until his death. He was a voluminous writer, his publications being chiefly of a theological and controversial character. They include a doctrinal work on the *Controversy Between Unitarians and Other Denominations of Christians* (1835); *Lectures to Young Men; Lectures on the Sphere and Duties of Woman; Lectures on the History of Christianity; Expository Lectures on the Principal Texts of the Bible Which Relate to the Doctrine of the Trinity.*

BURNE-JONES, Sir Edward, English painter: b. Birmingham, 1833, Aug. 28; d. London, 1898, June 17. In 1852 he went to Exeter College, Oxford, where he was a fellow student of William Morris, and afterward became acquainted with A. C. Swinburne (who dedicated his *Poems and Ballads* to him). His first intention was to enter the Church of England, and it was not till he had reached his 22d year that he seriously devoted himself to art studies; but, going to London in 1855, he came under the influence of D. G. Rossetti and the Pre-Raphaelite movement, and soon attained considerable success in various departments of artistic work. In 1859 he set out on a journey through Italy in order to see the productions of the early Italian painters and sculptors, and on his return to England he gave in his stained-glass designs and his pictures splendid promise of his subsequent triumphs. In 1865 he began a series of illustrations to Morris' *Earthly Paradise*, and he also executed some 70 designs for the *Story of Cupid and Psyche*, besides pictures dealing with the same subject. He was elected a member of the Old Society of Painters in Water Colors in 1864, but withdrew from it in 1870, and from this year till 1877 scarcely ever exhibited in London. In the Grosvenor Gallery exhibition of the latter year, however, his works formed the chief attraction. He received the Cross of the Legion of Honor in 1880, was elected in 1885 Associate of the Royal Academy, a position which he resigned in 1893 (having only exhibited one picture at

the Academy, *The Depths of the Sea*); and he was created a baronet in 1894. His most important pictures are *Day, Night; Spring, Summer, Autumn, Winter* (1867–8) *The Wine of Circe* (1869); *Chant d'Amour* (1873); *Beguiling of Merlin* (1877), an illustration of Tennyson's *Merlin and Vivien; Six Days of Creation* (1877); *The Golden Stairs* (1880); *The Wheel of Fortune* (1883); *Wood Nymph, King Cophetua* (1884); *Laus Veneris, The Depths of the Sea* (1886); and *The Briar Rose Series* (1890). He holds a specially high place as a designer for stained-glass windows, and in many other departments of decorative art. His leading characteristics as a painter are his fertile imagination and fine poetic feeling, qualities which no painter of the century has possessed in anything like the same degree. The Old-World dreaminess of his work is finely aided by his wonderful power as a colorist.

BURNES, *bėrnz*, Sir Alexander: 1805–1841, Nov., b. Montrose, Scotland, where his father, cousin of Robert Burns the poet, was magistrate. Sir Alexander was a distinguished traveller in central Asia. He early entered the Indian army, and his knowledge of oriental languages gained him rapid promotion. After performing some important missions for the Indian government, he was, at his own suggestion, sent on an expedition into Central Asia. Starting from Lahore 1832, Feb. 11, Burnes, having adopted the dress and usage of the Afghans for greater safety, passed through Peshawur and Cabul, and crossing the Indian Caucasus, reached Balkh June 9. Thence he passed to Bokhara, Astrabad, and Teheran, and journeying through Ispahan and Shiraz, reached Bushire on the Persian Gulf, whence he embarked for India. In 1839, Sep., having been knighted and promoted to the rank of lieut. col., he was appointed political resident at Cabul, where he was murdered on the breaking out of the insurrection 1841, Nov. Burnes was author of *Travels into Bokhara* and a work on *Cabul*.

BURNET, n. *bėr'nėt* [from *burn*, referring to the acrid and pungent taste of the root]: name of two genera of plants, *Sanguisorba* and *Poterium*, belonging to the nat. ord. *Sanguisorbeæ* (q.v.)—generally regarded as a sub-order of *Rosaeeæ*—which have much resemblance to one another, and receive a common name also in other languages. *Sanguisorba* has hermaphrodite flowers with four stamens; in *Poterium*, the flowers are polygamous, and the stamens indefinite in number. In both the calyx is 4-fid, and the corolla wanting.—Great B. *(Sanguisorba officinalis)* is common in meadows in all parts of Europe, particularly where the soil is calcareous. It has a stem ½ ft. high, pinnate leaves, with about four pair of ovate serrated leaflets and an odd one; flowers crowded in dark red spikes. Common B. (*P. Sanguisorba*) grows in the middle and south

of Europe. In habit and foliage it much resembles the Great B., but the leaflets are smaller and the flowers are in heads of a dull purplish color. It has been much cultivated in some parts of England as a substitute for clover on chalky soils. and is relished by cattle. It forms great part of the natural pasture of the South Downs, and of the excellent sheep-walks of Salisbury Plain. It is regarded as a plant particularly suitable for poor, arid soils. It is sometimes

Common Burnet (*Poterium Sanguisorba*).

cultivated in gardens, and its leaves, slightly astringent, are used in salads or soups. They are said to form one of the ingredients of the famous *cool tankard*, and the name *Poterium* is from a Greek word signifying a drinking vessel.—Both this and the preceding are perennial plants.—There are several other species both of *Sanguisorba* and *Poterium*, some of the latter shrubby, natives chiefly of the warmer temperate parts of the world.

BUR'NET, Gilbert, Bishop of Salisbury, England: 1643, Sep. 18—1715, Mar. 17; b. Edinburgh. He was educated at home, and afterward at Marischal College, Aberdeen, where he took his degree of M.A. before he was fourteen years of age. In less than three years he mastered the chief systems of divinity, besides having gone over the Old and New Testaments in the original, with all the Commentaries of note in his time. In 1663, he visited Cambridge, Oxford, and London, where he met many of the leading divines of England. Next year, he went to Holland, and perfected his knowledge of Hebrew under a learned rabbi of Amsterdam. In 1665, he was presented to the parish of Saltoun, where he remained five years. In 1669, he was appointed prof. of divinity in the Univ. of Glasgow, but being involved in the politico-ecclesiastical affairs of the time. he brought upon himself the

enmity of Lauderdale, and found it prudent to resign his chair 1674. He now removed to London, and was made preacher at the Rolls' Chapel by Sir Harbottle Grimston, and afterward lecturer at St. Clement's. In 1676, he published his *Memoirs of the Dukes of Hamilton*, and in 1679, the first vol. of his *History of the Reformation*, which procured him a vote of thanks from both houses of parliament. Next year appeared *Some Passages in the Life and Death of the Earl of Rochester*, in which B. records the religious interviews which he had with that profligate nobleman during his last illness, and which led to the latter's conviction of the truth of Christianity. In 1681, he published the second vol. of his *History of the Reformation*, and in 1682, his *Life of Sir Matthew Hale*. Efforts previously made were renewed, to induce him to break with the liberal and moderate party, and to attach himself to the king. He was offered the bishopric of Chichester, but refused it. In 1683, he narrowly escaped being brought into trouble in regard to the Ryehouse plot. He conducted the defense, attended the execution, and vindicated the memory of his friend Lord William Russell. The king exhibited his unkindly spite by depriving B. of his St. Clement's lectureship. On the accession of James II., he went to the continent and travelled through France, Italy, Switzerland, and Germany. In 1684, he was introduced to the Prince of Orange, with whom be became a great favorite, and by whom he was frequently consulted in reference to the great scheme for the deliverance of England. When William came over, B. accompanied him in the capacity of royal chaplain, and shortly afterward was appointed bishop of Salisbury. He entered on the duties of his diocese with great ardor; but his first pastoral letter, in which he founded the right of William to the throne on conquest, gave so much offense to both houses of parliament, that they ordered it to be burned by the hands of the common hangman. William, however, who knew the excellent qualities of the bishop, was not greatly impressed by this solemn performance, and continued to trust B. to the end of his life. In 1698, B. was appointed preceptor to the Duke of Gloucester; in 1699, he published his celebrated exposition of the 39 Articles, which was condemned as heterodox by that not very competent theological authority, the house of lords. In 1714, appeared the third vol. of his *History of the Reformation*. In the spring of the next year, he died of pleuritic fever. B was thrice married: his first wife was remarkable for her beauty; the second, for her wealth; and the third, for her piety.

Soon after B.'s death, appeared *Bishop B.'s History of his Own Time, from the Restoration of King Charles II. to the Conclusion of the Treaty of Peace at Utrecht, in the Reign of Queen Anne.* It was sarcastically but foolishly abused by the tory writers of the day —Swift, Pope, Arbuthnot, and others. B. was a man of strict, almost puritanic virtue; yet he was a model of charity, geniality, and moderation of sentiment. His style is neither elegant nor correct, and

his judgment is not always reliable, yet the honesty, earnestness, simplicity, and vigor of his writings, as well as their fulness of details, make his works very valuable to the student of history.

BURNET, JACOB, LL.D.: jurist: 1770–1853; b. Newark, N. J.: son of Dr. William B.: graduated at Princeton 1791. He was admitted to the bar 1796, and removed to the new settlement at Cincinnati the same year, where he became a successful lawyer and a prominent citizen. He served successively in the legislature 1812, as judge of the supreme court 1821–28, and as U. S. senator 1828–31. He published *Notes on the Early Settlement of the Northwestern Territory.*

BURNET, JOHN: 1784, Mar.—1868; b. Fisherrow, near Edinburgh: painter, engraver, and author. He was first brought under the notice of the public through his admirable engravings of Wilkie's works. Of his own paintings, the best known engraving is that of *Greenwich Pensioners receiving News of the Battle of Trafalgar.* He wrote several works on art, illustrated by drawings and engravings of his own, the most important of which is a *Practical Treatise on Painting.* He was author of *Rembrandt and his Works,* 4to, 1849; and in conjunction with Mr. Peter Cunningham, of *Life and Works of J. M. W. Turner,* 1852.

BURNET, THOMAS: 1635–1715: b. Yorkshire, England: known from his *Theory of the Earth.* He studied at Cambridge. After acting as travelling tutor to several noblemen, he was elected master of the Charter-house (1685), and later, succeeded Abp. Tillotson as clerk of the closet to William III. But having (1692) published a work *Archæologiæ Philosophicæ, sive Doctrina Antiqua de Rerum Originibus* (also in English), showing great learning, but treating the Mosaic account of the Fall as an allegory, he was obliged to retire from the clerkship, and lived in the Charter-house to his death. His *Telluris Theoria Sacra* (first part, 1680; second, 1689) was written in Latin, but translated, or rather recomposed in English, by the author, and received great applause. It is an ingenious speculation, written in ignorance of the facts of the earth's structure, and therefore a mere system of *cosmogony,* and not geology. But it abounds in sublime and poetical conceptions and descriptions, in language of extraordinary eloquence.

BURNETT, FRANCES (HODGSON): author: 1849, Nov. 24— ————; b. Manchester, Eng. Living there till her sixteenth year, she became familiar with the Lancashire dialect and local color, and thus acquired material for *That Lass o' Lowrie's* (1876), which story made her famous. Her parents emigrated to America 1865, and settled in Knoxville, Tenn.; and soon afterward she began to write, contributing short stories to the magazines. In 1873 she was married to Dr. Luan M. B., of Knoxville; divorced, 1898, she married (1900) Stephen Townsend, an English writer, and has since resided in Washington, D. C. The fame of *That Lass o' Lowrie's* revived some earlier stories, such as *Surly Tim's Trouble,* which had made little or no impression

at the time of their publication. A number of her earlier tales were soon reprinted without her consent, among them being *Pretty Polly Pemberton, Kathleen Mavourneen, Theo, Miss Crespigny,* and *Lindsay's Luck.* Her dialectal power and genius of observation were shown again in *Louisiana* (1880)—a sketch from among the mountaineers of N. C., brief, but of great strength and pathos. *A Fair Barbarian* followed (1881), and *Through One Administration* (1883). These stories all were published serially, and the last named had a curious history not fully revealed to the public. *Little Lord Fauntleroy* (1886) is one of the most successful of modern juvenile stories; has been dramatized, and translated into several foreign languages. Her later stories, *The Making of a Marchioness* (1901), *The Little Unfairy Princess* (1902), *A Little Princess* (1905), etc., show no diminution of power.

BURNETT, Peter Hardeman, American pioneer and writer: b. Tennessee, 1807; d. 1895. In early life he removed to Missouri and thence to Oregon where he assisted in establishing a territorial government and sat for two terms in the legislature. He was one of the first of the gold hunters in California in 1848 and actively advocated organization of civil government without delaying for action of Congress. When the new constitution was adopted he was elected governor resigning in 1851. He was judge of the supreme court, 1857–8, and president of the Pacific Bank of San Francisco, 1863–80. He published *The Path Which Led a Protestant Lawyer to the Catholic Church* (1860); *The American Theory of Government Considered with Reference to the Present Crisis* (1861); *Recollections of an Old Pioneer* (1878); *Reasons Why We Should Believe in God, Love God, and Obey God* (1884).

BUR'NETT PRIZES, The: two theological premiums, founded by Mr. Burnett (1729–84) of Dens, Aberdeenshire, Scotland. These prizes (not less than £1,200 and £400) are awarded every 40 years in Aberdeen for the two best essays on 'The evidence that there is a Being all-powerful, wise, and good, by whom everything exists,'—evidence 'independent of written revelation.' The competition is open to the whole world, and the prizes are adjudicated by three persons appointed by the trustees of the testator, together with the ministers of the Established Church of Aberdeen, and the principals and profs. of King's and Marischal colleges, Aberdeen.

BURNEY, *bėr'nĭ,* Charles, mus. doc.: 1726–1814, Apr. 19; b. Shrewsbury, Eng.: author of the *General History of Music.* Having studied music in his native city, in Chester, and under Dr. Arne in London, he commenced giving lessons. After composing three pieces —*Robin Hood, Alfred,* and *Queen Mab*— for Drury Lane, Burney left London, and settled at Lynn, in Nor-

folk, where he designed his work on the *History of Music.* In 1770–72 he travelled in France, Italy, the Netherlands, and Germany, collecting materials for his proposed work, and published an essay on the *Present State of Music in France and Italy,* etc. (2 vols., Lond. 1772). This was followed by his *General History of Music from the earliest Ages to the present Period* (4 vols., Lond. 1776–89). Besides other works Burney wrote a *Life of Handel,* and nearly all the musical articles in *Rees's Cyelopædia.* In 1789 he became organist to Chelsea Hospital, where he died. He was intimately acquainted with many of the most eminent men of the day, including Edmund Burke and Dr. Johnson.—His second daughter, FRANCISCA B. (afterward Madame D'Arblay), became distinguished as authoress of the novels *Evelina, Cecelia, Georgina,* and *Camilla:* see D'ARBLAY, FRANCES.

BURNEY, CHARLES, English classical scholar and critic, son of Charles Burney (1726–1814, q.v.): b. Lynn, Norfolk, 1757, Dec. 4; d. 1817, Dec. 28. He received his education at the Charter-house School, at Caius College, Cambridge, and King's College, Aberdeen, where he took the degree of M. A.. He carried on a private school, distinguished himself as a writer in the *Monthly Review* and the *London Magazine,* to which he contributed many articles on classical literature; subsequently entered into holy orders, and obtained some preferment in the Church. His valuable collection of books, many of them enriched with manuscript notes, was purchased by Parliament for the British Museum.

BURNEY, FRANCES. See D'ARBLAY, MADAME.

BURNHAM, *bėr'năm,* CLARA LOUISE (ROOT), American novelist: b. Newton, Mass., 1854, May 25. She is the daughter of George F. Root (q.v.), and has lived in Chicago since childhood. Her novels include *No Gentleman* (1881); *A Sane Lunatic* (1882); *Dearly Bought* (1884); *Next Door* (1886); *Young Maids and Old* (1888); *The Mistress of Beech Knoll* (1890); *Miss Bagg's Secretary* (1892); *Dr. Latimer* (1893); *Sweet Clover, a Romance of the White City* (1894); *The Wise Woman* (1895); *Miss Archer Archer* (1897); *A Great Love* (1898); *A West Point Wooing* (1899); *A Right Princess* 1902); *Jewel* (1903); *Jewel's Story Book* (1904). She has also written libretti for her father's cantatas.

BURNHAM, DANIEL HUDSON, American architect: b. Henderson, N. Y., 1846, Sept. 4. He studied architecture in Chicago and designed notable structures there, including the Rookery, Calumet Club, the Temple, Masonic Temple, and the Great Northern Hotel, as well as Ellicott Square, Buffalo, and large buildings in other cities. He was director of works at the Chicago World's Fair.

BURNHAM, SHERBURNE WESLEY, American astrono-

mer: b. Thetford, Vt., 1838. He started in life as a stenographer, and became a clerk in the United States Circuit Court, northern district of Illinois. He took up astronomy as an amateur, and, in 1876, became connected with the Chicago Observatory, and later with the Lick Observatory, receiving also an appointment as professor of practical astronomy at the University of Chicago. He has made notable discoveries of double stars, having catalogued 1,274 new ones. In 1874 he was made a Fellow of the Royal Astronomical Society of England, receiving its gold medal in 1894 for the discovery and measurement of double stars. He was awarded the Lalande prize in astronomy by the Paris Academy of Sciences in 1904.

BURNISH, v. *bėr'nĭsh* [F. *brunir*, to polish; *brunissant*, polishing: Sw. *bryna*, to sharpen; *brynsten*, a whetstone]: to make bright and glowing by rubbing; to polish by friction; to make smooth and bright by rubbing; to become bright by friction: N. lustre; brightness. BUR'NISHING, imp. BUR'NISHED, pp. *-nĭsht*, polished: ADJ. that has been made bright and glowing by rubbing. BUR'NISHER, n. the person or tool that burnishes.

BURNLEY, *bĕrn'lē:* thriving town and parliamentary borough in Lancashire, in a narrow vale on the banks of the Brun, near its junction with the North Calder, 24 m. n. of Manchester. It has manufactures of cottons and woolens, calico printing works, iron and brass foundries, machine-making works, breweries, tanneries, and rope-works. There are collieries in the vicinity, and traffic is facilitated by railways and canals, which unite it with the principal centres of trade in Lancashire Yorkshire. Burnley returns one member to parliament.

A Roman vicinal way passed through the town, part of which is still known and used as the 'Long Causeway.' Roman coins, pottery, urns, etc., have been found near the town, and an extensive series of beacons, encampments, dikes, etc., occupy the slopes of the hills in the neighborhood for a linear distance of more than 10 miles. From the name of the river, *Brun*, and other circumstances, these slopes are supposed to furnish a very probable site for the battle of Brunnanburh, so celebrated in Saxon history. Pop. of parliamentary borough 97,000.

BURNOOSE, n. *bėr'nôs* or *-nôz* [A. *burnus*, a kind of high-crowned cap, a cap and cloak: Sp. *albornoz*, a Moorish cloak]: Arabic name of a garment worn in Algeria, Morocco and other parts of n. Africa. It is a large woolen mantle, worn above the other attire of the natives, and having a hood, which is thrown over the head in rainy weather. The Burnoose is generally white, though distinguished individuals wear it of various colors—blue, green, red, etc.

BURNOUF, EMIL LOUIS, *ā-mēl lô-ē bür-nôf*, French

Orientalist, cousin of Eugène Burnouf (q.v.): b. Valognes, Manche, 1821, Aug. 25. After a normal-school training, he became professor of ancient literature in the faculty of Nancy, and in 1867 director of the French School in Athens. Among his works are: *Essay on the Veda* (1863); *Sanskrit-French Dictionary; History of Greek Literature; Science and Religions; The Athenian Legend; The Mythology of the Japanese; The City and the Acropolis of Athens;* and *Contemporary Catholicism* (1879). He also edited the letters of his cousin, Eugène Burnouf.

BURNOUF, *bür-nôf'*, EUGENE: 1801, Apr. 1—1852, May 28; b. Paris: distinguished orientalist. After entering on the study of law, he betook himself to the oriental languages, especially those of India and Persia. In conjunction with Prof. Lassen, of Bonn, he published, 1826, *Essai sur le Pali*, which was followed, 1827, by *Observations Grammaticales sur quelques Passages de l'Essai sur le Pali.* His great aim, however, at this time, was to obtain a complete knowledge of the remains of the religious literature in the Zend, or old Persic language, neglected since the time of Anquetil du Perron, or, at least, not philologically and critically examined. Burnouf undertook to decipher those curious MSS. Anquetil du Perron had brought home with him, and which lay unregarded in the *Bibliothèque Impériale.* He commenced by causing the *chef-d'œuvre* of old Persic literature, the *Vendidad-Sadé* (one of the books of Zoroaster), to be lithographed with great care, and he published from time to time in the *Journal Asiatique* the brilliant results of his laborious studies, which drew upon him the regard of the learned world. In 1834, he published the first vol. of his *Commentaires sur le Yaçna l'un des Livres Liturgiques des Perses*, a work which, for the first time, rendered possible a knowledge not only of the dogmas, but also of the language of Zoroaster. It is a master-piece of conscientious industry, with copious lingual and antiquarian lore. His studies in the Zend language induced him to make an attempt to decipher the cuneiform inscriptions of Persepolis, in his *Mémoire sur deux Inscriptions Cunéiformes* (Par. 1836). In 1840, he published the text with a translation of the *Bhâgavat-Purâna*, a system of Indian mythology and tradition. As the fruit of his study of the Sanskrit books of the Buddhists, appeared 1845 the *Introduction àl'Histoire du Boudhisme.* See BUDDHISM. This great work absorbed for six years the whole energies of Burnouf, who was now the recognized successor of Silvestre de Sacy. In full tide of work he died.

BURNS, JOHN: English labor leader; b. 1858, Oct. He went to work in a candle factory at the early age of ten, and his experiences there led him later in life to

investigate the condition of the working classes in England generally. He subsequently learned the engineer's trade, and for several months worked as foreman-engineer on the river Niger. On his return he made a tour of Europe for the purpose of studying labor conditions, and in 1876 he became known as an avowed advocate of trade unionism and socialism. In 1887 he contested the right of free speech in Trafalgar Square, London; was active in the organization of the dock laborers in 1889, and was a member of the committee which brought their strike to a close. In 1899 he was elected to the London County Council, and to Parliament the same year. Since that date he has been a member of both bodies, and has worked consistently for the advancement of labor interests without radicalism. On the organization of the liberal ministry of Great Britain (1905–1906) he was appointed president of the local Government Board, and thus became the first representative of labor to hold a cabinet position. His appointment, however, was criticised by advanced Socialists as well as radical opponents of union labor; but it was approved by the more conservative elements, and was regarded generally as a worthy tribute to his personality and the cause which he had so ably and consistently represented.

BURNS, Robert: 1759, Jan. 25—1796, July 21; b. in a small cottage near Ayr: great lyric poet of Scotland. His father, then a nursery gardener, afterward occupant of a small farm, had to struggle all his life with poverty and misfortune, but made every exertion to give his children a good education; and the young poet had an amount of instruction and miscellaneous reading which, to those unacquainted with the habits of the Scottish peasantry, would seem incompatible with the straitened circumstances and early toil which were his lot. About his 16th year, he began composing verses in the Scottish dialect, which attracted notice in the vicinity, and extended the circle of his acquaintance; and thus he became exposed to temptations which, acting on an extremely sociable and passionate disposition, broke in upon the previous sobriety and correctness of his life. A small farm, on which he had entered with his brother in 1781, proved far from a prosperous undertaking; and being harassed and imbittered by other misfortunes—the results of imprudence—he resolved to leave his native land, and go to Jamaica. Partly to procure the means of paying his passage, he published a collection of his poems at Kilmarnock, 1786. The reception these met with was highly favorable, and his genius was recognized in quarters where he had not looked for notice. While preparing to embark he received a letter encouraging him to go to Edinburgh, and issue a new edition. This was the turning point of his life. During his stay in the Scottish metropolis

he associated with men eminent in letters, rank and fashion, and his conversational powers excited little less admiration than his poetry. The profits of the publication were considerable, and enabled him to take the farm of Ellisland, near Dumfries, where he settled, 1788, having publicly ratified his marriage with Jean Armour. With his farm he conjoined the office of exciseman; but after three or four years, he was obliged to give up farming, and from that time lived in Dumfries, dependent on his salary from the Excise, which, at first only £50, never rose above £70. The striking contrasts in the lot of the rich and the poor with which his residence in Edinburgh had impressed him, made him hail the French Revolution with enthusiasm; and some imprudent expressions having been reported to the authorities, destroyed his prospects of promotion in the service, and only the influence of a friend prevented him from losing his office. Such was then the terror of innovation, and the hatred of everything like liberal opinions, than many of the better-classes, who had fêted the poet, now shunned the 'Jacobin,' as they stigmatized him. Imbittered by what he felt an injustice, he recklessly allowed those habits of dissipation to grow upon him which made the more respectable of all classes look coldly upon him; and the remorse thus occasioned in his calmer moments aggravated the tendency to melancholy which the gloom and toil of his early years had probably implanted in his constitution; and, broken in health, he died.

The poetry of Burns is purely the outpouring of the moment—the response of the feelings to the immediate circumstances of life. Its charm and power lie in the justness of the feelings expressed, and in the truthfulness and freshness which it derives direct from life. Seldom have such manliness, tenderness, and passion been united as in the songs of Burns. They formed the first awakening of the spirit of true poetry in Britain after a long slumber. The popularity that Burns instantly acquired has continued unabated, not only in his native Scotland, but wherever English is spoken; his poems have been translated also into almost every European tongue. Dr. Currie, of Liverpool, published the first collected edition of his poems and letters, with a life (4 vols. Lond. 1800). Several more complete collections have appeared since, such as that by Allan Cunningham (8 vols. Lond. 1834), and that by Mr. Scott Douglas, of which the first volumes appeared in 1877. A life of Burns, by Lockhart, appeared in Edin., 1828. In *The Life and Works of Burns* (Edin. 1851–2), by R. Chambers, the poems are incorporated in the narrative in chronological order.

BURNS AND SCALDS: These two conditions are practically of the same nature, the first being the result of contact of the body with fire or a dry heat, the

second that of the action of a hot fluid or steam. For purposes of description surgeons divide burns into several classes or degrees according to the amount and depth of destruction of the tissue. When the skin is simply reddened and painful but not actually injured, the burn is called of the first degree; a burn of the second degree is one that causes inflammation and blistering of the skin; in a burn of the third degree the entire structure of the skin is destroyed and perhaps a portion of the subcutaneous tissues as well; a burn of the fourth degree is one that chars all the tissues down to and even possibly including the bone. Some writers recognize only three degrees, a burn which actually destroys any tissue being called one of the third degree; other writers again recognize as many as six degrees according to the depth to which the tissues are destroyed. The severity of a burn depends not only upon its degree but also upon its extent, and a burn of the third degree, if it involves only a small amount of tissue—and that not of a vital structure, causes less constitutional disturbance than a burn of the first or second degree covering a wide area of the surface of the body.

The treatment of a burn will vary necessarily according to the extent and degree. In a case of a burn of the first degree of moderate extent—not over one-third of the body, practically the only indication is to relieve the pain. This is generally effected by protecting the part from contact with the air. The burned surface may be freely dusted with carbonate of soda, or covered with an ointment of carbonate of soda and vaseline. The soda may be dissolved in water and cloths wet in the solution laid on the part and covered with oiled silk, or a solution of nitre may be used in the same way.

A mixture of equal parts of linseed oil and lime-water, called Carson oil, is an old and efficacious application, and a supply is often kept on hand in smithies and manufacturing establishments where the workmen are liable to suffer from burns in their occupation. When blisters have formed these should be nipped with sharp scissors at their most dependent part and the water allowed to drain away.

Burns of the third and fourth degrees should be dressed aseptically to prevent suppuration. When the skin of the face or neck or that of the extremities covering the joints has been destroyed, skin grafting will often be necessary to prevent disfigurement and disability from contraction of the scar. Constitutional treatment is often called for, especially when the burn covers an extensive area, and in that which a burn of the third or fourth degree, or even one of the usual degrees, involving a wide surface, is apt to induce calls for prompt attention. Attention to the diet is necessary as there may be ulceration of the intestines follow-

ing exensive burns and the presence of a bulky mass of undigested food might lead to rupture of the bowels.

BURNSIDE, Ambrose Everett, General: 1824, May 23—1881, Sep. 3; b. Liberty, Ind. His ancestors had emigrated from S. C., and Ambrose, the fourth of nine children, was born at the edge of what was then a wilderness. He was apprenticed, after a most ordinary school education, to a tailor, and was for a time in a partnership in that business in the town of his birth. Having accidentally gained the friendship of the congressman of his district, he received an appointment as a candidate at the Military Acad. at West Point, and entered the class of 1847. He graduated near the close of the war with Mexico, and was sent to that city during its military occupation. For some years he did garrison duty on the frontier, but in 1852 married, and resigned his commission. He invented the Burnside breech-loading rifle, but was unsuccessful in getting it adopted by the war dept. and was eventually forced into bankruptcy. For a time he had employment under George B. McClellan on the Ill. Central railroad, and in 1860 was treas. of that road. In 1861 Gov. Sprague, of R. I., gave him the command of the 1st regt. of the militia of that state. He commanded a brigade at the first battle of Bull Run, and 1861, Aug. 6, was commissioned a brig. gen, of vols. He organized the expedition which occupied Newberne, N. C., and occupied Fort Macon, and Beaufort. He was afterward commander of the 9th army corps, and did excellent and important work at the battle of Antietam. In 1862, Nov. 10, he was appointed commander of the Army of the Potomac. The unfortunate failure at Fredericksburg affected Burnside's reputation disastrously, though perhaps with injustice. An order, however, issued by Burnside subject to the president's approval, formally dismissing such generals as Hooker, Franklin, Newton, and Brooks, having failed of approval, Burnside was superseded by Maj. Gen. Hooker, and transferred to the dept. of the Ohio. Burnside did some good fighting in Tenn., but being returned to the Army of the Potomac was unsuccessful in the management of operations in the Wilderness and at Cold Harbor and Petersburg, and charges having been brought against him, of disobedience, by Gen. Meade, a court of inquiry was ordered, and he was found 'answerable for the want of success.' He resigned 1865, Apr. 15, and a year later was elected gov. of R. I., and re-elected 1867 and 1868. He passed some time in Europe, and in 1875 was elected U. S. senator from R. I., and in 1880 re-elected. While in Europe during the siege of Paris he acted as a medium of communication between the Germans and the French. He died suddenly at Bristol, R. I. Gen. Burnside was a man of most agreeable manners and disposition. As a sol-

dier and as a commander of an army corps he rendered valuable services, but proved himself unable to cope with the problems and difficulties which fall to the lot of a commanding general. Consult Woodbury, *Major General Burnside and the Ninth Army Corps* (Providence, 1867); Poore, *Life and Public Services of Ambrose E. Burnside* (Providence, 1882).

BURNSIDE, Helen Marion, English artist and poet: b. Bromley Hall, 1844. She published a book of poems in 1864, which made her widely known. From 1880 to 1889 she was designer to the Royal School of Art Needlework. She has published *The Lost Letter, Tales for Children, The Deaf Girl Next Door* (1899), and many occasional contributions in prose and verse to leading magazines.

BURNT, *bėrnt:* pt. and pp. of Burn, which see: applied to a peculiar taste and flavor of certain wines and spirits. Burnt sugar, a preparation used for darkening liquors.

BURNT-EAR, n. *bėrnt ēr:* a disease in corn in which the whole ear appears black, caused by a fungus, which covers the seed coat with a black dust, while leaving the interior apparently uninjured, but abortive.

BURNTISL'AND: seaport town of Fifeshire, Scotland, on the n. shore of Firth of Forth, about 8 m. n.n.w. of Edinburgh. It consists of one long street, clean and well kept, with a back street running parallel, and some diverging lanes. Burntisland is an important station of the North British railway, having a steamboat ferry connecting it with Granton, the station on the opposite side of the Forth. It has a commodious harbor, greatly improved 1876, and a dock. Its trade consists principally in distilling, and the shipping of coal and iron; and in summer it is considerably resorted to as a convenient watering-place. It unites with Kinghorn, Dysart, and Kirkcaldy to send one member to parliament. Pop. 5,000.

BURNT-OFFERING, n. *bėrnt-ŏf'fėr-ĭng:* something burnt on an altar, as an offering for sin, called also *burnt-sacrifice;* a holocaust. It was one of the sacrifices enjoined on the Hebrew Church and nation. It is called, in their language, *olah,* from the root *alah,* to ascend, because, being wholly consumed, all but the refuse ashes was regarded as ascending in the smoke to God. In the New Testament it is called *holokautōma,* meaning a whole burnt offering, an offering wholly burnt. In the Vulgate it is called *holocaustum,* which has the same meaning. Stated burnt offerings were presented daily, every Sabbath, at the new moon, at the three great festivals, on the day of atonement, and at the feast of trumpets. Private ones might be presented at any time.

BURNT SIËN'NA: fine orange-red pigment, transparent and permanent, used both in oil and water color painting; obtained by burning the ferruginous ochreous

earth known as Terra di Sienna. Excellent greens are produced by mixing it with Prussian blue. It mixes well with other pigments generally, and dries quickly.

BURNT STONES: antique carnelians found in ruins, and seeming to have been acted upon by fire, having a dull appearance externally, but exhibiting a beautiful red color when held up to the light. They are sold at a very high price, particularly if to the natural beauty of the stone is added the merit of fine workmanship. They were formerly more esteemed than now, and an imitation of them, by burning the upper surface of carnelians with a hot iron, was very common.

BURNT UM'BER: pigment of a russet-brown color; semi-transparent. It mixes well with other pigments, and dries quickly. It is obtained by burning umber, an ochreous earth, containing manganese, and deriving its name from the place where it was first discovered—Umbria in Italy.

BURNUG'GUR: town of India, in Guzerat, the territory of the Guicowar, 52 m. n. from Ahmedabad; n. lat. 23° 48′, e. long. 72° 38′. It is a place of considerable trade, mostly in the hands of wealthy Brahmans. Pop. 12,000.

BURR, n. *bĕr* [see BUR]: the lobe of the ear; a prickly seed.

BURR, n. *bĕr* [a word imitative of the sound: Swiss, *burren*, to mutter: prov. Sw. *borra*, to buzz like a beetle: Scot. *birr*, the sound as made by a spinning-wheel]: the whirring, guttural, or rough sound made by some in pronouncing the letter *r*, as in the mouth of a north of England man.

BURR, n. *bĕr:* the blossom of the hop; the first appearance of its flower. *Note.*—This word has doubtless the same origin as the Scot. *braird*, meaning the first sprouting of grain—and may be connected with *bur* or *burr*, as in *bur*dock, from the rough appearance of the hop-cone.

BURR, AARON: Presb. minister, prcs. of the College of New Jersey: 1716–57; b. Fairfield, Conn.; of Puritan ancestry. At the age of 19 he graduated at Yale College, and at 22 became pastor of the Presb. Church of Newark, N. J., where he quickly won a reputation for eloquence and scholarship. In 1748 he was elected pres. of the College of New Jersey; in which office he continued until his death, caused by overwork. B. was practically the first pres. of the institution, Jonathan Dickinson, the first by the record, having held the office only a few months. Of his published works the most important are the *Newark Latin Grammar*, used at Princeton for many years, and the *Supreme Divinity of Our Lord Jesus Christ.*

BURR, AARON: statesman: 1756, Feb. 6—1836, Sep. 14; b. Newark, N. J.; son of Aaron B. (q.v.), a clergyman from Conn. His grandfather on his mother's side was the celebrated Rev. Jonathan Edwards, and he was educated by his uncle the Rev. Timothy Edwards, of Elizabethtown,

N. J. A studious boy, Burr was prepared to enter Princeton college at the early age of 11, but was not permitted under the rules to enter at that time, but did so in 1769, by special favor, in his 13th year. He graduated with distinction 1772, Sept. A year later, after giving considerable time and study to religious questions, he adopted infidel opinions, and proceeded to form his character on the basis of that of Lord Chesterfield. He began the study of law 1774, but in 1775, at the outbreak of the Revolution, volunteered into the patriot army. He accompanied Benedict Arnold on his expedition to Quebec, and returned a major, with a brilliant reputation for courage and ability. For a short period he was a member of Gen. Washington's family, but retired from it to accept an appointment as aide on the staff of Gen. Putnam. From this time forward Washington and Burr never agreed. In 1777, Burr was made lieut.col., distinguishing himself at Monmouth, and in 1779, after four years of service, resigned on account of his health. He resumed the study of law, was admitted to the bar, and began practice in Albany. He married Mrs. Theodosia Prevost 1782. She died of cancer in 1794, leaving one daughter, a most accomplished and brilliant woman, passionately beloved by her father, and who died at sea, 1813, Jan. In 1783, Burr settled in New York, where he became one of the leaders of the bar. He served twice in the New York legislature, held the office of attorney-gen. for two years, and in 1791 was elected to the U. S. senate, where he served for six years with the republican party, exhibiting remarkable ability. On completing his term in the senate, Burr was made a member of the New York assembly. In 1800 he was elected vice-pres. on the ticket with Thomas Jefferson, but in this contest he discovered, as was alleged, political traits which caused him to be generally distrusted. He was afterward defeated as a candidate for the governorship of New York, and in connection with this canvass there arose the trouble with Alexander Hamilton that resulted in the latter being challenged by Burr. The parties met at Weehawken, N. J., on the morning of 1804, July 11 and Hamilton fell, mortally wounded, at the first fire. This tragedy raised such public feeling against him that, a verdict of murder having been returned by the coroner's inquest, Burr fled to South Carolina. He was indicted for murder, but after a time the excitement wore itself out and he returned to Washington, where he filled his term as vice-pres. His political prospects were now blasted, and he turned his attention in the direction of the West, which he visited, going from Pittsburg to New Orleans and exciting much enthusiasm. It was at this time that Burr made the acquaintance of Harman Blennerhassett (q.v.), an acquaintance which resulted in one of the worst scandals attached to Burr's

name. He now appears to have formed the idea of controlling a large tract of land, either by conquest or purchase, and of establishing a government, with himself at its head. He purchased property on the Washita river and continued to prosecute his plans, when 1806, Oct. 27, the president, who had kept himself informed of Burr's proceedings issued a proclamation denouncing the whole undertaking as treasonable. Burr was arrested 1807, Jan. 14, escaped, and was again arrested in Ala. and conveyed to Richmond, Va. Here he was tried for treason, the trial beginning May 22, and lasting six months. On Sept. 1, the jury returned a verdict of 'not guilty' of the indictment for treason, and Burr was afterward acquitted on technical grounds of the additional charge of misdemeanor.

He was now completely ruined in character and fortune, in his own country, and accordingly sailed for England, where he hoped to establish himself, but from which country he was eventually expelled. He spent some time in Sweden, Denmark, and Germany, and in 1810, Feb., reached Paris. Here he became reduced to penury, and after suffering the severest straits returned to England, where he was forced to remain for over a year and a half before he was able to leave for America. Successful in this at last, he reached Boston, 1812, May, and went thence to New York. Here he opened an office in Nassau street, and began to practice law, when the death of his grandchild, and soon afterward of his daughter, completely crushed him. He was not only unsuccessful in practice, but was entirely ostracized from society, yet he lived 23 years longer, and at the age of 78 married Madam Jumel, the wealthy widow of a French merchant. They separated, however, on account of Burr's extravagances, and during his latter days, Burr was dependent on the charities of a Scotch woman who had been his friend in former years. She furnished him a home at Port Richmond, Staten Island, where he died. His remains, in accordance with his request, were buried in the cemetery at Princeton, near those of his father and grandfather. In person Burr was below the medium height, but his manners and presence were very attractive. He was an adroit, persevering, but not a great lawyer. He cannot be said to have been an orator, yet he was an effective and ready speaker. It has been usual to regard Burr as a brilliant, and even a great man, who was led astray by moral obliquity. In regard to the looseness of his principles, there can be no doubt; but there is a growing tendency to relieve his name of much of the odium that formerly attached to it. Consult Davis, *Memoirs of Aaron Burr* (1836); *Parton, Life of Aaron Burr* (1858); Tompkins, *Burr Bibliography* (1892); *Todd, The True Aaron Burr* (1902); McCaleb, *The Aaron Burr Conspiracy* (1903).

BURR, Edward, American soldier: b. Booneville, Mo., 1859, May 19. He studied at Washington University 1874–8, and at the United States Military Academy 1878–82, and on graduation at the latter was assigned to the corps of engineers with the rank of second lieutenant. He was promoted first lieutenant in 1883, and captain in 1894; and as lieutenant-colonel of volunteers commanded the battalion of engineers in the campaign against Santiago de Cuba in June–July 1898. He is a member of the American Society of Civil Engineers.

BURR, Enoch Fitch, American mathematician and clergyman; b. Green's Farms, Fairfield County, Conn., 1818, Oct. 21. He graduated at Yale in 1839, and became pastor of the Congregational Church in Lyme, Conn., in 1850. Since 1868 he has been a lecturer at Amherst College. Among his works are: *A Treatise on the Application of the Calculus to the Theory of Neptune* (1848); *A Song of the Sea* (1873); *Aleph, the Chaldean* (1891); etc.

BURR, George Lincoln, American historian: b. Oramal, N. Y., 1857, Jan. 30. He graduated at Cornell in 1881 and entered its faculty in 1888, becoming professor of ancient and mediæval history there. He has written *The Literature of Witchcraft*, and works on superstition and persecution. He was expert in history to the Venezuelan Boundary Commission (1896–7).

BURR, Theodosia, (Mrs. Joseph Allston), daughter of Aaron Burr (1756–1836): b. New York, 1783; d. 1813. She was carefully educated and became very accomplished, showing particular linguistic talent. After the death of Mrs. Burr she presided over her father's household until her marriage in 1801 to Governor Allston of South Carolina. Her correspondence with her father after her removal to the South is of great interest and shows continued devotion to his interests. Her beauty, brilliant personality, and relationship to the famous statesman drew public attention to her, especially during her father's trial, and had the effect of enlisting public sympathy in his behalf. In 1812 she sailed from Charleston in the Patriot for New York, but the vessel was never heard from and was believed to have been lost in the storm or sunk by pirates. An unverified rumor was long current to the effect that she was made to walk the plank.

BURR, William Hubert, American educator: b. Waterloo, Conn., 1851, July 14. He graduated at Rensselaer Polytechnic Institute 1872; was employed by the Wrought Iron Bridge Company of New York, and later on the water supply and sewerage system of Newark, N. J. He was assistant professor and later professor of rational and technical mechanics at Rensselaer Polytechnic Institute 1876–84; became assistant engineer

of the Phœnix Bridge Company 1884, and subsequently its general manager; was professor of engineering in the Lawrence Scientific School of Harvard University 1892–3, consulting engineer to the New York city department of public works 1893–5, of parks and of docks 1895–7; and later of bridges. Since 1893 he has been professor of civil engineering at Columbia University. He is author of *The Stresses in Bridge and Roof Trusses; Arched Ribs and Suspension Bridges; Elasticity of the Materials of Engineering; The Theory of Masonry Arches,* etc.

BURRAGE, Henry Sweetzer, American clergyman: b. Fitchburg, Mass., 1837, Jan. 7. He was graduated from Brown University, 1861, and entering the 36th Massachusetts as a private, rose to the rank of captain, and brevet-major of volunteers. After the war he resumed his studies, graduated at Newton Theological Seminary, 1867, was at the University of Halle, Germany, 1868–9, and became a Baptist clergyman in 1869. He was pastor at Waterville, Maine, 1869–73; editor of *Zion's Advocate,* 1873–; recording secretary of the American Baptist Union, 1876–. He has edited: *Brown University in the Civil War* (1868); *Henry W. Longfellow's 75th Birthday* (1882); *History of the 36th Regiment of Massachusetts Volunteers* (1884); and has written *The Act of Baptism in the History of the Christian Church* (1879); *History of the Anabaptists in Switzerland* (1882); *Baptist Writers and their Hymns* (1888); *History of the Baptists in New England* (1894); *The First Mention of Pemaquid in History* (1894); *The St. Croix Commission* (1895); *History of the Baptists in Maine* (1904); etc.

BURRANPOOTER: see Brahmaputra.

BURRAS-PIPE, n. *bŭr'ras-pīp:* a tube to contain lunar caustic or other corrosives.

BURREL, n. *bŭr'rĕl* [OF. and Prov. *burel;* O.L. *burnis,* red, reddish]: a sort of pear, otherwise called the red butter-pear, from its smooth, delicious, and soft pulp.

BURRHSTONE, or Burrstone, n. *bėr'stōn,* or Burrelstone, n. *bėrl'stōn* [*burr* or *birr,* a word imitative of a rubbing, grating, or rough sound—so named from the bite or roughness of the stone: Ger. *burren,* to whirr, to purr]: a silicious or flinty stone, largely used in the manufacture of the finer millstones: see Buhrstone.

BURRIANA: town of Spain, province of Castellon-de-la-Plana; about 8 m. s. from the town of that name; on the left bank of the Rio Seco, about 1 m. from its mouth in the Mediterranean. The people are engaged chiefly in agriculture and fishing; exports are wine, oil, and fruit. Pop. about 15,000.

BURRILL, *bŭr'rĭl,* James: 1772–1820; b. Providence,

R. I.: lawyer and statesman. He graduated 1788, studied law, and was admitted to the bar 1791. He served as attorney-gen. of R. I. 1797–1813, became chief justice 1816, was elected U. S. Senator 1817, and was prominent in the debates on the Missouri Compromise, which he ably opposed.

BURRILL, THOMAS JONATHAN, American naturalist: b. Pittsfield, Mass., 1839, April 25. He graduated at the Illinois State Normal University in 1865, and in 1867 was botanist of Powell's first Rocky Mountain Expedition. Since 1868 he has been a member of the faculty of the University of Illinois and has held the following offices in the University: Professor of botany and horticulture, 1868–1902; dean of the College of Science, 1877–84; vice-president since 1879; acting president, 1889–90; 1891–94 and 1904; dean of the Graduate School since 1894, and professor of botany since 1902. The honorary degree of LL. D. was conferred upon him in 1893 by the Northwestern University. He is a member of several American and foreign scientific societies, and is well known from his writings under more than 100 titles mostly upon the parasitic diseases of plants, bacteriology, microscopy, fruit growing, forestry, landscape gardening, and modern education.

BUR'RILLVILLE: town and township of Providence co., R. I., on the Providence and Springfield railroad, about 20 m. n.w. of Providence. It has a national bank, and manufactories of woolen and cotton goods. The township contains the villages of Pascoag, Harrisville, Tarkiln, Mohegan, Oakland, Mapleville, and Glendale. Pop. 6,500.

BURRITT, *bŭr'ĭt*, ELIHU: 1811–79, Mar. 7; b. New Britain, Conn.: known as 'the learned blacksmith.' He was brought up to the trade of a blacksmith; but devoted all his leisure to study, especially to mathematics and languages. In the latter field of study, his range was very wide, embracing more or less Latin, Greek, Hebrew, Arabic, and other oriental tongues, and almost all modern European and Slavonic languages. He is, however, much better known to the world as an earnest apostle of peace than as a scholar. To preach the doctrine of 'universal brotherhood,' he traveled through the United States and Europe. His chief works are, *Sparks from the Anvil*, *Olive Leaves*, *Peace Papers*, and *Lectures and Speeches*. He was prominent in the Peace Congresses of Brussels, Paris, Frankfort, London, and Edinburgh, and in advocating an ocean penny-postage. For many years he resided in England, part of the time as U. S. consul at Birmingham.

BURRO, n. [Span.]: a small donkey used in mountainous districts as a pack-animal.

BURROCK, n. *bŭr'rŏk* [AS. *burg*, hill, and *ock*,

diminutive termination]: a small dam in a river for catching fish.

BURROUGHS, *bŭr'rōz*, George Stockton, American educator: b. Waterloo, N. Y., 1855, Jan. 6; d. 1901. He graduated at Princeton College, 1873, and at its Theological Seminary, 1877. He removed to New England in 1880, and served in the ministry of the Presbyterian Church in Fairfield and New Britain, Conn. He was professor of biblical literature at Amherst College, 1886–92; president of Wabash College, Crawfordsville, Ind., 1892–9; and became professor of Old Testament language and literature in Oberlin Theological Seminary in 1899.

BURROUGHS, John, American essayist and naturalist: b. Roxbury, N. Y., 1837, April 3. He taught school for about eight years, was for a time a journalist, and then became a clerk in the Treasury Department and subsequently a national bank examiner. He settled on a farm in New York State and has since devoted himself to fruit-culture, nature-study, and literature. Many of his papers were written in his bark-covered study (to which he has given the name 'Riverby') on the banks of the Hudson. The personal element is very marked in his writings, and the charm of his easy familiar style has done much to popularize the study of nature. His books on rural themes include: *Wake Robin;* (1871); *Winter Sunshine* (1875); *Birds and Poets* (1877); *Locusts and Wild Honey* (1879); *Pepacton: Notes of a Walker* (1881); *Fresh Fields* (1884); *Signs and Seasons* (1886); and *Sharp Eyes* (1888); *Indoor Papers.* He has also written *Notes on Walt Whitman* (1867); *Whitman: a Study* (1897); *The Light of Day; Squirrels and Other Fur-Bearers; Literary Values; Far and Near,* etc. In 1903 he accompanied President Roosevelt on a trip through the West, including a lengthy sojourn in the Yellowstone National Park in close communion with the wild life of that magnificent game preserve.

BURROUGHS, Marie (Lillie Arrington), American actress: b. San Francisco, 1866. At the age of 18 she went to New York and made her début as Gladys in *The Rajah,* assuming the stage name of Marie Burroughs. She appeared as Mary Bleakern in *The Middleman,* Vashti in *Judah,* etc. In 1894 she was the star in *The Profligate.* In 1899 she acted with Stuart Robson in *The Meddler* and in 1900 filled the role of Guida Landrasse in *The Battle of the Strong.*

BURROUGHS, Stephen, American adventurer: b. Hanover, N. H., 1765; d. Three Rivers, Canada, 1840, Jan. 28. The son of a Congregational clergyman, his vicious jokes and propensity to trick people into misadventures made him early reputed the worst boy in town. At the age of 14 he ran away from home to join the army, which he later deserted. After

studying under a clergyman in Connecticut, he entered Dartmouth College, where he continued his mischievous career. He left the college clandestinely before graduating, and was successively privateersman, ship's physician, and schoolmaster. At length he determined to go where he was unknown and preach. Under the name of Davis he had excellent success as pastor of a Congregational Church in Pelham, Mass., until after nearly six months his character was revealed by persons who had formerly known him. Having entered into relations with a gang of counterfeiters, though still occasionally preaching, he was arrested in Springfield for pasing counterfeit money, and convicted. He was imprisoned at Northampton, and for his numerous attempts to escape was loaded with chains. He sought to end his sufferings by firing the jail and was afterward removed to Castle Island in Boston Harbor, whence he effected his escape with seven other prisoners, but was retaken. When he was released he went to Canada, where for many years he was at the head of an association of counterfeiters. In the latter part of his life he thoroughly changed his conduct, joined the Roman Catholic Church, and passed his last years in receiving and educating at his residence the sons of wealthy Canadian gentlemen. He was beloved by his pupils, had an extensive library of choice books, and was noted for his happy faculty of communicating his great stores of knowledge. Few men have possessed equal capacity, and even during the worst part of his career his charitable deeds were hardly less remarkable than his iniquities. He described his early life in two autobiographical volumes, written with great naturalness and force.

BURROW, n. *bŭr'rō* [AS. *beorgan,* to protect, to shelter: Dut. *berghen,* to hide, to cover: Gael. *buraich,* to dig]: an underground hole or excavation, where small animals such as the rabbit live: V. to make holes underground and live in them; to live in a concealed place. BUR'ROWING, imp. BUR'ROWED, pp. *-rōd.*

BURROWING OWL, or COQUIM OWL: see OWL.

BURROWS, *bŭr'ōz,* WILLIAM: 1785–1813; b. near Philadelphia, Penn.: naval officer. He served in the war with Tripoli, holding the rank of lieut.; returned to this country in 1807. The following year he commanded a gun-boat on the Delaware, and enforced the embargo. In command of the *Enterprise,* he encountered the British brig *Boxer,* 1813, Sep. 1, off Portland, Me., and captured her after an engagement of 45 minutes. The commanders of both vessels, being killed in this action, were buried side by side in Portland.

BURSA, n. *bėr'să,* BURSÆ, plu. *bėr'sē:* a sac of fibrous tissue lined internally with synovial membrane (q.v.) and filled with fluid of the same character as that contained in the joints (see SYNOVIA). The

bursæ are found in the body on parts exposed to pressure or friction, and have the same function as an air cushion employed to relieve pressure on the bony prominences of an emaciated person when sitting or lying. 'True' bursæ are found in parts normally exposed to pressure; 'false' bursæ are adventitious sacs of the same nature, and having the same function, which are formed when any bony part becomes unusually prominent, or when some part is exposed to continuous pressure or friction; an instance of the latter is the fluid sac formed on the shoulder of a porter who habitually carries sacks or other heavy weights resting in this position. A false bursa is at first a simple fibrous bag containing serous fluid, but if the cause producing it is continued it gradually develops a synovial membrane and so may become converted practically into a true bursa.

When subjected to unusual pressure or injury a bursa may become inflamed, the condition being then called 'bursitis' or 'hygroma.' A familiar form of chronic bursitis is 'house-maid's knee.' (See BURSITIS.)

BURSCH, n. *bôrsh*, BURSCHEN, n. plu. *bôrsh'ĕn* [Ger., a room-mate, a chum]: a student in a German university.

BURSCH'ENSCHAFT: a fellowship organization formed by German university students in the early part of this century for the purpose of placing themselves on record as against the quarrelsome and otherwise vicious habits at that time frequent among the students. The design of this association contemplated also the awakening of a spirit of nationality, in the interest of the Fatherland, by uniting the students of different universities in one body. The first union of this nature occurred at Jena, 1815; successive conventions were held at Heidelberg, Halle, Tubingen, and other university towns. The German war of independence had attracted many of the students who engaged in it, and who afterward believed that it would be followed by certain greatly demanded political reforms. This, however, did not occur, and one result of the disappointment was a general meeting or festival of all the Burschenschaft at the Wartburg, 1817, Oct. A year later delegates from 14 German universities adopted a constitution, which was agreed to by nearly all the institutions, and also a resolution to hold annual conventions. The colors of the German empire, black, red, and gold, were chosen, and the Burschenschaft began to assume a somewhat formidable political standing. The assassination of Kotzebue was charged against the Burschenschaft, who had declared him a traitor to his country and the German government now took steps to suppress the organization. This movement was unsuccessful, but

drove the members to meet secretly instead of openly. Conventions were held at Bamburg in 1827, and Frankfort in 1831; and in 1833, June, a grand united revolutionary movement was made by the students at Frankfort-on-the-Main, in which nearly 2,000 students were involved. The attempt was unsuccessful. Students from nearly all the German universities were arrested and prosecuted, and many of them were imprisoned and disfranchised. This dampened the ardor of the students, and their organization was very quiet for a number of years. In 1848 the students of Vienna brought it again into notoriety by the part which they took in the revolution of that year.

BURSE, n. *bėrs* [F. *bourse*, a purse, an exchange—from mid. L. *bursa*, a small leather purse—from Gr. *bursa*, leather, skin]: a public building where merchants and money-dealers meet on business; an exchange. BURSAR, n. *bėr'sėr*, the treasurer of a college or monastery; a student in a Scotch university to whom a sum of money is paid out of a fund set aside for that purpose; an exhibitioner. BUR'SARSHIP, n. the position or office of a bursar. BUR'SARY, n. *-i*, the treasury of a college or monastery; the sum allowed to a bursar; an exhibition.

BURSE, n. *bėrs* [It. *borsa*, a purse (see BURSE 1)]: in the *R. Cath. Ch.*, a square stiffened case or purse, which contains the 'corporal' required in the celebration of mass (see CORPORAL). BURSIFORM, a. *bērs'i-fawrm* [mid. L. *bursa*, a purse; *forma*, shape]: shaped like a purse; sub-spherical.

BURSICULE, n. *bėrs'i-kūl*, or BURSICULA, n. *bēr-sik'-ū-lă* [L. diminutive of *bursa*, skin]: in *bot.*, the part of the rostellum of the orchids excavated in the form of a sack. BURSICULATE, a. *bēr-sik'ū-lāt*, purse-like.

BURSITIS, *bėr-sī'tis:* Inflammation of a bursa (q.v.). This may be either acute or chronic. The acute form is usually due to a blow or wound, though it may arise from extension of inflammation from a boil in the neighborhood. There is at first a swelling of the part caused by an increase of fluid in the sac, and as the walls of the latter are very resistant the pressure of the fluid usually causes acute pain and a feeling of tension. The skin over the bursa is red and hot and may be puffy. This condition may continue for a few days and then disappear with the absorption of the superfluous fluid, or the symptoms may increase in severity owing to the formation of pus in the bursa. When this occurs the pain becomes very intense and throbbing in character, the heat, redness and swelling of the overlying skin increase, and the patient becomes feverish. If left to itself the sac will eventually burst through one or more openings which continue to discharge for an indefinite

period. The treatment of the simple form (*serous*) consists in rest and the application of cooling lotions. When pus has formed the inflamed sac should be lanced so as to give free exit to the contained matter.

Chronic bursitis may follow the acute serous form when the latter does not get well spontaneously in response to proper treatment, or it may arise gradually as the result of unusual and long continued pressure or friction over a bursa. The latter is a frequent result of certain occupations. Its most familiar form is the 'house-maid's knee,' in which an enlargement of a bursa at the knee follows constant kneeling of a maid in washing the floor. The same thing is sometimes seen in clergymen and others who kneel in prayer for many hours a day on a hard floor or bench. A similar condition is that called 'miner's elbow.' This is an enlargement of a bursa at the elbow occurring in miner's who have to use the pick in a confined space with the elbow resting against the rocky wall. In the treatment of this form of bursitis the cause must be removed. The fluid may then be gradually absorbed, but if it persists the sac must be opened and injected with an irritating fluid which causes the walls to adhere, thus obliterating the bursa, or the entire sac must be removed.

BURSLEM, *bêrs'lĕm:* town of Staffordshire, England, on the Trent and Mersey canal, in the pottery district; on a branch of the North Staffordshire railway. It forms part of the parliamentary borough of Stoke-upon-Trent. The abundance of coal and the variety of clays have made Burslem, since the 17th c., one of the chief seats of the fictile manufacture. Porcelain and pottery of all kinds—Parian, iron, and stone ware, etc. —are produced on a large scale, as well as encaustic tiles. There is also a glass manufactory here. The affairs of the town are managed by a 'local board of health.' At Birche's Head, a mile and a half from Burslem, is a large service reservoir of the Staffordshire Waterworks Company, from which the town and neighborhood are supplied with excellent water. A fine, new town-hall was erected 1865, which, besides the usual municipal offices, contains lecture-rooms and news rooms. Burslem was the native place of Josiah Wedgwood, who in the middle of the 18th c. greatly improved the manufacture of pottery. A Wedgwood memorial institute was founded 1863, to serve as a school of art, a free library, and a museum. An appropriate character is given to it by introducing into the ornamentation of the façade *terra-cotta* mouldings, Wedgwood's jasper ware, etc. Pop. 38,766.

BURST, n. *bêrst* [Gr. *berstcn;* AS. *berstan;* Sw. *brista;* O.H.G. *brestan;* F. *briser,* to break]: a sudden breakage; an explosion; a violent outbreak: V. to break open forcibly or with sudden violence; to break away

from; to come upon unexpectedly; to break forth, or into, with violence; to rend by force. BURST'ING, imp.: ADJ. breaking forth; expanding: N. the act of breaking forth, or expanding. BURST, pp. BURST'ER, n. one who. BURSTING-CHARGE, the quantity of powder in a shell sufficient to burst it. BURST-WORT, a name sometimes given to the botanical genus *Herniaria* or Rupture-wort.

BURT, n. *bėrt:* a flat fish of the turbot kind.

BURT, MARY ELIZABETH, American educator: b. Lake Geneva, Wis. She studied at Oberlin College and entered the teaching profession. For three years she was a member of the Chicago board of education. Later she undertook editorial work and lecturing. She edited *Little Nature Studies for Little People; Seed Thoughts from Robert Browning,* etc.; has contributed frequently to periodical literature and is the author of: *Browning's Women; Literary Landmarks; The World's Literature; German Iliad (Siegfried); Stories from Plato and other Classic Writers;* and collaborated in writing *The Literary Primer,* and *The Boy General,* etc.

BURT, THOMAS, English labor leader: b. Northumberland, 1837, Nov. 12. He began work in the coal-mines at 10 years of age. In 1865 he began to take an interest in the labor movement and soon became prominent as a trades-unionist. He was president of the Trades Union Congress in 1891. Since 1874 he has had a seat in Parliament as a Liberal.

BURT, WILLIAM A., American surveyor: b. Worcester, Mass., 1792, June 13: d. 1858, Aug. 18. After acting as a surveyor in New York State he removed to Michigan in 1824. Between 1840 and 1847 he surveyed a great part of northern Michigan. He introduced improved methods of surveying and invented the solar compass. He was judge of the Michigan circuit court and member of the legislature, and one of the projectors of the Sault Ste. Marie canal.

BURTHEN, n. *bėr'thn,* BUR'THENSOME, a., BUR'THENSOMENESS, n.: see BURDEN 1.

BURTON, n. *bėr'tn:* in a *ship,* a small tackle of two single blocks, said to be named from the inventor.

BURTON, *bėr'tn,* ERNEST DE WITT, American Biblical scholar: b. Granville, Ohio, 1856, Feb. 4. He graduated at Denison University in 1876 and at Rochester Theological Seminary in 1882, and went to Europe for further study in Leipsic and Berlin. From 1882–3 he taught in the Rochester Theological Seminary; and from 1883–92, in the Newton Theological Institution, first as associate professor and later as professor of New Testament Interpretation. In 1892 he was appointed head professor of New Testament Interpretation in the University of Chicago. Among his works are: *Syntax of the Moods and Tenses in New Testament*

Greek; Harmony of the Gospels for Historical Study; Handbook of the Life of Christ (in collaboration with W. A. Stevens); *Records and Letters of the Apostolic Age; Handbook of the Life of Paul; Constructive Studies in the Life of Christ* (in collaboration with Shailer Mathews); *Short Introduction to the Gospels* (1904); *Studies in the Gospel of Mark* (1904); *Principles of Literary Criticism and Their Application to the Synoptic Problem* (1904), etc. In 1892 he became associate editor of the *Biblical World*, and in 1897 of the *American Journal of Theology*.

BURTON, Sir Frederick William, Irish artist: b. Limerick, 1816; d. London, 1900, March 15. He received his education in Dublin. He was elected to the Royal Hibernian Academy in 1837, and in 1842 exhibited at the London Royal Academy. He is best known for his work as director of the National Gallery, in London, to which post he was chosen in 1874, and which he held for 20 years.

BURTON, John Hill, ll.d., d.c.l.: 1809, Aug. 22—1881, Aug. 10; b. Aberdeen. He was an advocate (member of the Scottish bar), author of a variety of works, all remarkable for ability, and several for original thought. Burton's father was an officer in the army, and his mother the daughter of an Aberdeenshire laird. Having graduated at Marischal College, Aberdeen, he became an apprentice to the profession of law, in his native city; which he abandoned for the higher sphere of the Edinburgh bar. With time on his hands, he applied himself to study and letters. For a long series of years, from 1833, he was a contributor to the *Westminster Review* of articles on law, history, and political economy; and for several years he contributed to *Blackwood's Magazine* literary sketches. Among his original works are: *The Life and Correspondence of David Hume*, 2 vols. (1846); *Lives of Simon Lord Lovat and Duncan Forbes of Culloden* (1847), excellent biographies; *Political and Social Economy* (1849), valuable, condensed, and lucid contribution to the literature of social science; *Narratives from Criminal Trials in Scotland; A Manual of Scottish Law; A Treatise on the Law* (Scottish) *of Bankruptcy; The History of Scotland from the Revolution to the Extinction of the Last Jacobite Insurrection*, 2 vols. (1853); *The History of Scotland from Agricola's Invasion to the Revolution of* 1688, 7 vols. (1867–70); *The Book-Hunter* (1862); *The Scot Abroad*, 2 vols. (1864); *The Cairngorm Mountains* (1864). A new ed. of the *History of Scotland*, enlarged and partly rewritten, appeared in 8 vols., 1873. He edited vols. i. and ii. of the *Register of Privy Council* (Scotland) for 1545–78; and issued *A History of the Reign of Queen Anne*, 1879. The high merits of Burton's historical works have been universally admitted. He further edited the works of Jeremy Bentham (nom-

inally in conjunction with the late Sir John Bowring), with an able introduction; and published a volume of *Benthamiana.* Burton was, 1854, appointed sec. to the prison board of Scotland; and on the abolition of that board 1860, he remained as stipendiary manager and sec. in connection with the home office. He held the old office of historiographer royal for Scotland, was LL.D. of Edinburgh Univ., and D.C.L. of Oxford.

BURTON, Lewis William, American clergyman: b. Cleveland, 1852, Nov. 9. He was educated at Kenyon College and the Philadelphia Divinity School, & orders in the Protestant Episcopal Church in 1878, and was successively in charge of parishes in Cleveland, Richmond, and Louisville. In 1896 he became bishop of Lexington, Ky.

BURTON, Richard, American poet and journalist: b. Hartford, Conn., 1859, March 14. He graduated from Trinity College, Hartford, and took a degree at Johns Hopkins University. He taught Old English at Johns Hopkins 1888; was managing editor New York *Churchman* 1888–9; literary editor Hartford *Courant* 1890–7; associate editor of Warner's *Library of the World's Best Literature* 1897–9; professor of English literature, University of Minnesota 1898–1902; and since 1902 has been lecturer on English literature in the University of Chicago. He has published *Dumb in June* (1895); *Memorial Day* (1897); *Lyrics of Brotherhood* (1899); *Song of the Unsuccessful* (1900); *Message and Melody—A Book of Verse* (1903), all poems; and *Life of Whittier,* in *Beacon Biographies Series* (1900); *Forces in Fiction,* essays (1903); *Literary Leaders of America* (1904); etc.

BURTON, Sir Richard Francis, English traveler, linguist and author: b. Barham House, Herfordshire, 1821, March 19; d. Trieste, Austria, 1890, Oct. 20. He was educated at Oxford, with the intention of entering the Church; but in deference to his own urgent request, his father obtained a commission for him in the East India Company's service. He joined the army in 1824, served for some years in Sind, under Sir C. Napier, explored the Neilgherry Hills, published an important work on Sind, and acquired a complete knowledge of the Persian, Afghan, Hindustanee, and Arabic languages. Returning to England in 1851, he soon afterward set out to explore Arabia, disguised as an Afghan pilgrim, and published on his return a *Personal Narrative of a Pilgrimage to El-Medinah and Mecca* (1855), as the result of this daring adventure. His next expedition was into the Somali country in East Africa, from whence he proceeded to the Crimea, where he was chief of the staff of Gen. Beatson, and organized the irregular cavalry. After peace was proclaimed, Burton set out in 1856 along with Capt. Speke to explore the lake region of Central Africa. The expedition was absent

three years, and during that time the great Lake Tanganyika was discovered by Burton. Subsequently, he made a journey in the western states of North America, and published an account of the Mormon settlement at Utah, in his *City of the Saints.* In 1861 he married, and he received the same year an appointment as consul at Fernando Po. While fulfilling his duties here he explored the Bight of Biafra, visited the Kamerun Mountains, and conducted a dangerous mission to the King of Dahomey. Afterward he was transferred to the consulate of Santos in Brazil, and here he explored his own province, visited the Argentine Republic, crossed the continent to Chile and Peru, returned home after exploring the Pacific coast, and published his *Explorations of the Highlands of Brazil.* He was now (1871) made counsul of Damascus, but was soon recalled, and in the following year, after a journey to Iceland, an account of which he wrote, he was appointed consul at Trieste. While occupying this position he led two expeditions into Midian (1876–8); and in company with Commander Cameron he conducted an expedition into the gold-producing country behind the Gold Coast. He remained English counsul at Trieste until his death. In his latter years his services to geographical science were acknowledged by the gold medals of the French and English geographical societies, while in 1886 his services to his country were tardily recognized by the honor of knighthood. Besides the books of travel already mentioned, he was the author of many others, such as: *Sind, or the Unhappy Valley* (1851); *Goa and the Blue Mountains* (1851); *Falconry in the Valley of the Indus* (1852); *First Footsteps in East Africa* (1856); *The Lake Region of Central Africa* (1860); *Abeokuta, or an Exploration of the Kamerun Mountains* (1863); *Narrative of a Mission to the King of Dahomey* (1864); *The Nile Basin* (1864); *Vikram and the Vampire* (1869); *Zanzibar* (1872); *Two Trips to Gorilla Land* (1875); *Ultima Thule, or a Summer in Iceland* (1875); *Etruscan Bologna* (1876); *Sind Revisited* (1877); and *The Gold Mines of Midian* (1878). In 1885–8, he published a remarkable literal translation of the *Arabian Nights* entitled *The Thousand Nights and a Night.* His manuscript translation with notes, from the Arabic of *The Scented Garden,* of great value to scholars, was burned by his widow, who deemed it an immoral work. Consult lives by Hitchman (1887); Lady Burton (1893); Stisted (1897).

BURTON, *bĕr'tn,* Robert: author of the *Anatomy of Melancholy:* 1576–1640; b. Lindley, in Leicestershire, England. He studied at Brasenose and Christ Church, Oxford. 1616, he was appointed to the vicarage of St. Thomas, and in 1628, to the rectory of Segrave in his native county. He appears, however, to have continued all his life at Christ Church, where he died,

leaving legacies of £100 each to the Bodleian and Christ Church libraries, and as many of his books as they did not already possess. A monument was erected to his memory in Christ Church Cathedral. Burton is described by Anthony Wood as a good mathematician, a dabbler in nativities, a well-read scholar, and a thorough-paced philologist. 'As he was by many accounted a severe student, and a melancholy and humorous person, so by others who knew him well, a person of great honesty, plain-dealing, and charity. I have heard some of the ancient of Christ Church often say that his company was very merry, facete, and juvenile.' His *Anatomy of Melaneholy*, in which he appears under the title of Democritus Junior, is one of the most curious *melanges* of heterogeneous elements ever put together. It consists mainly of an extraordinary mass of quotations from old and obscure writers, strung on a thread of rambling reflection; often tiresomely pedantic, but relieved by quaint touches of humor and feeling. In his own lifetime, it was highly popular and went through five editions; after that it fell into comparative oblivion, but is now again popular among lovers of quaint literature. Dr. Johnson said it was the only book that ever took him out of bed two hours before his usual time.

BURTON, *bér'tn*, WILLIAM EVANS: comedian: 1804—1860, Feb. 9; b. London; son of a printer and writer on Bible Researches. It was intended that he should be a clergyman, but he early turned to editing and amateur acting, and soon made the stage his profession, spending several years on the Norwich circuit. He appeared at the Haymarket 1832, wrote *Ellen Wareham* and other plays, and came in 1834 to America, where he was noted and successful as a manager. He built the National Theatre in Philadelphia, and in 1841 took charge of one in New York, which was soon burned. He controlled what had been Palmo's Opera House in Chambers st., 1847–56, and for two years the Metropolitan Theatre in Broadway. He was unsurpassed in many comedy parts, and eminent as a Shakespearian scholar. He started the *Gentlemen's Magazine* 1837, edited the *Literary Souvenir* 1838–40, and compiled a *Cyclopedia of Wit and Humor* (2 vols., 1858). He died in New York.

BURTON-ON-TRENT: market-town in Staffordshire, England, on the river Trent and the Midland railway. The Grand Trunk canal also passes the town, and enters the Trent below. A bridge of 34 arches, built before the Norman Conquest, here crossed the river, but was replaced 1864 by a new one of 29 arches. The growth of the town is due to the rapid extension of the brewing of ale, the staple product of the place. There are upward of 30 breweries in Burton-on-Trent, some of a magnitude elsewhere unparalleled. The two establishments of Bass and Allsopp cover together more than 250

acres of ground, and can produce yearly about two million barrels of ale. There are, of course, extensive cooperages, and also iron-foundries. The public edifices are not particularly noticeable. Pop. (1901) 50,386.

BURTSCHEID, *bûrt'shīt*, or BORCETTE': town of Rhenish Prussia, about half a mile from Aix-la-Chapelle, with which it is connected by an avenue of trees. It has manufactures of woolen cloths and cassimeres, and celebrated sulphur springs and baths, with a temperature of 106°—155° F. Pop. 13,380.

BURT'SELL, RICHARD LALOR, American clergyman: b. New York, 1840, April 14. He studied in Rome and was ordained to the priesthood in 1862. After returning to the United States and having charge of parishes in New York he was appointed 'defender of the marriage tie' being the first to fill this office, which in 1884 was instituted in the Catholic Church in the United States. Having become connected with the movement headed by Rev. Dr. McGlynn, he was retired from his parish to one of less prominence in 1890. In 1904 he was elevated to the dignity of Domestic Prelate by Pope Pius X. and is now rector of Saint Mary's Church, Kingston, N. Y.

BURU, *bô-rô'*, or BOEROE, Malaysia, an island of the archipelago, in the residency of Amboyna, from which it lies about 40 m. to the w. Area, with the small island of Amblau, 3,360 sq. m.; population variously estimated at from 10,000 to 50,000. The marshy coast lands are notoriously unhealthful, but lofty mountains rise in the interior, one peak (Tomahoe) attaining an altitude of 10,320 ft. A dense natural forest covers most of the country, and only a very small portion has been brought under cultivation. The soil is rich, and vegetation everywhere luxuriant.

BURWASH, NATHANAEL, Canadian educator: b. Argenteuil, near Saint Andrews, Quebec, 1839, July 25, of a loyalist family, who left Vermont during the American Revolution. He was educated at Victoria College, Cobourg, and Yale University, and entered the Methodist ministry in 1860. He was professor in Victoria College, 1867–73; dean of faculty of theology in 1873, and has been president and chancellor of Victoria University, Toronto, from 1887. He was secretary of education for the Methodist Church in Canada, 1874–86, and has devoted much time toward bringing about university federation in the province of Ontario. He has published *Memorials of Edward and Lydia Jackson* (1874); *Wesley's Doctrinal Standards* (1881); *Handbook on the Epistle to the Romans* (1887); *Inductive Studies in Theology* (1896); *Manual of Christian Theology* (1900); *Life and Times of Egerton Ryerson* (1902); etc.

BURWHA, *bûr'wâ*, or, as Dr. Barth spells it, BA'RUWA: town of Bornu, central Africa, on the w. bank of Lake Tchad, about 80 m. n.n.w. of Kuka. The town,

which consists of closely-packed huts, is surrounded by high clay-walls, which, however, 'owing to the high mounds of rubbish imbedding them on all sides,' afford no protection whatever from the attacks of the Tawarek, to whom the inhabitants have to pay tribute. Fish in great quantities are caught in the adjoining lake, and are the chief food of the inhabitants, as well as their only article of commerce. Pop. about 6,000.

BURY, n. *bĕr'ĭ* [F. *beurré, butter*]: a variety of pear, so named from its soft yellow flesh.

BURY, v. *bĕr'ĭ* [AS. *birgam;* Dut. *berghen,* to hide, to stow away: Ger. *bergen,* to conceal: comp. Gael. *bùraich,* to dig, to inter]: to put or place anything in the earth for concealment; to lay a dead body in the grave; to inter; to hide or conceal; to overwhelm; in *Eng. Ch.*, to perform the burial service. BURIED, pp. *bĕr'ĭd.* BURYING, imp. *bĕr'ĭ-ing:* N. the act of placing the dead in the earth. BURYING-PLACE, or BURIAL-PLACE, n. a graveyard; a cemetery. BUR'IAL, n. *-ĭăl* [AS. *byrgels,* and *byrigels,* a sepulchre]: the act of laying a dead body in the earth, in a tomb, in a vault, or among water, as at sea.

BURY, *bĕr'rĭ:* flourishing manufacturing town in the s.e. of Lancashire, England; on a rising ground backed by hills on the n. and e. between the Irwell and the Roche, 9 m. n.w. of Manchester. It was early a seat of the woolen manufactures, carried on by Flemings, but these, though still considerable, now yield in importance to those of cotton. Besides spinning and weaving factories, there are important print, bleach, paper, and dye works, and some large founderies and engine manufactories. In the vicinity are excellent freestone quarries, and abundant coal-mines. The town has been much improved in drainage, and an ample supply of water has been secured from a distance. It has a handsome town hall, an athenæum, a technical school and art gallery, a savings bank, the Bury Bank, Trevelyan Club, and Philips Hall, grammar school, public baths, railway station, etc. Among the churches, St. Mary's (the parish church) and St. Thomas' are perhaps the finest, being highly ornate Gothic buildings with tower and spire. There is also a handsome chapel belonging to the United Methodist Free Church, a fine Presbyterian church, and a Roman Catholic chapel. Bury returns one member to parliament. Some improvements in the cotton manufacture arose here—notably, the invention of John Kay of the fly-shuttle. The late Sir Robert Peel was born in Bury; where his father established his great print-works. A bronze statue of Sir Robert has been erected in the old market-place. Pop. (1901) 58,028.

BURY, *bĕr'ĭ,* JOHN B., Irish scholar: b. 1861, Oct. 16. He was graduated from Trinity College, Dublin, of which he is a Fellow; from 1893–1902 was professor

of modern history in Dublin University, and professor of Greek there in 1898. Since 1902 he has been Regius professor of modern history at Cambridge University. He has written *History of the Later Roman Empire from Arcadius to Irene* (1889); *Student's History of the Roman Empire from Augustus to Marcus Aurelius* (1893); *History of Greece to Death of Alexander the Great* (1902); *The Science of History* (1903); *Life of St Patrick and his Place in History* (1905); and has edited Pindar's *Isthmian Odes;* and *Nemean Odes;* Freeman's *History of Federal Government in Greece and Italy;* Gibbon's *Decline and Fall of the Roman Empire;* Freeman's *Historical Geography of Europe* (1903); etc.

BURY, Richard de, or Richard Aungerville, English clergyman and author: b. 1281; d. 1345. He was made bishop of Durham in 1333. His principal work, *Philobiblon,* was intended to serve as a handbook to the library which he founded in connection with Durham College at Oxford (afterward suppressed). It gives an interesting account of how he collected his library, describes the state of learning in England and France, and closes with an explanation of the rules for the management of his library, which were founded on those adopted for the library of the Sorbonne.

BUR'YING BEETLE (*Necrophorus*): genus of coleopterous (q.v.) insects, or the tribe or family *Silphales,* with short club-shaped antennæ, remarkable for their habit of burying the bodies of mice, moles, and other small animals, in order to deposit their eggs in them, and to provide a supply of food for their larvæ. Some of the species, among which is *N. Vespillo,* the species of which the habits were first observed, are common in parts of Europe; and the known species are mostly natives of Europe and N. America. It is a black beetle, about an inch long, with two bright orange bands across its back, and having an excessively fetid smell, which long adheres to whatever it touches. Its sense of smell seems extremely acute, and a dead animal soon attracts it, a pair generally arriving together, male and female, to feed upon the body, and the male to proceed to its interment, if the body be sufficiently small, previous to which, however, they have sometimes to drag it to some distance to a place suitable for their purpose. The head of the insect is the only tool employed in the operation, and is held sloping outward, and employed in a manner which exhibits great muscular power. A furrow is first made around the body, then another within the first, and so on till the earth is so excavated from beneath, that the body begins to sink, when the insects, by great efforts, drag it down into the hole, and when it is fairly in, the excavated earth is thrown back over it. The female then lays her eggs in it; and when this is accomplished, and the cravings of appetite are satis-

fied, it is left for the larvæ, which are of a lengthened form, with six feet, whitish, and a brown head.

BURY ST. ED'MUNDS, or ST. ED'MUNDSBURY: ancient borough in Suffolkshire, England, on the Upper Larke; 26 m. n.w. of Ipswich. It is well built and delightfully situated. It returns one member to parliament. It has a trade in agricultural produce, but no manufactures. A very complete system of drainage has been carried out, the sewage being conveyed to a distance, and, by means of pumps, applied to irrigation. A new Corn Exchange was erected 1862, in 1864, the Suffolk General Hospital was rebuilt. Bury St. Edmunds received its name from Edmund, the Saxon king and martyr, who was crowned here on Christmas Day, 856; taken prisoner, and put to death by the Danes. On the site of his tomb, six priests founded a monastery; and here Canute raised a Benedictine abbey, which in time became the richest and most important in England, after that of Glastonbury. From 1,020 to its dissolution by Henry VIII., it was ruled by a line of 33 abbots. The abot was a spiritual baron of parliament, had judicial authority in all causes within the liberty of Bury St. Edmunds, had the power of inflicting capital punishment, and the privilege of coining. At the dissolution, the annual income was equivalent to £50,000 sterling. Of this magnificent establishment, little now remains but the western gate, erected 1327, a noble relic of the decorated Gothic style; and the 'Church-gate,' a quadrangular tower of massive simplicity, 86 ft. high. The churchyard, to which this tower formed the portal, includes, besides the abbey ruins, and some other buildings, the fine old churches of St. Mary and St. James. The celebrated grammar-school of Bury St. Edmunds was founded by King Edward VI. 1550, and is free to sons of the inhabitants of the town. It has 2 scholarships at Cambridge, and 6 exhibitions to each university, and has produced many eminent scholars. Among the many religious and charitable institutions connected with the abbey, of which portions still exist, is St. Saviour's Hospital, founded by that notable abbot, Samson, whose life and actions, as recorded by Jocelyn of Brakelond, Mr. Carlyle has so vividly recalled in his *Past and Present*. The poet Lydgate was a monk in this abbey; and Sir Nicholas Bacon was born here. At Bury St. Edmunds, King John first met his indomitable barons before he signed Magna Charta. Parliaments were held here 1272, 1296, and 1446, the last of which ordered the arrest of Humphrey, the good Duke of Gloucester, who was found dead in his bed the morning after his arrest; and sovereigns, as late as Elizabeth's time, were often nobly entertained at St. Edmund's town. Three miles s.w. of Bury St. Edmunds, the Marquis of Bristol has a splendid seat, Ickworth Park, a circular pile 90 ft. in diameter, and 140 ft. high. Pop. 17,000.

BUS, n. *bŭs:* a contraction of *omnibus.*

BUSACCHINO, or Bisaquino: see Bisacquino.

BUSACO, *bô-sâ'ko:* ridge or serra on the n. side of the river Mondego, province of Biera, Portugal; about 20 m. n.n.e. of Coimbra. Here Wellington, with about 40,000 British and Portuguese troops, repulsed the attack of Massena with 65,000 French, 1810, Sep. 27. Unable to force the position, Massena turned it by a pass over an adjoining ridge, and Wellington retired behind the lines of Torres Vedras, which indeed it was his intention to do, had there been no battle.

BUS BARS: a contraction for omnibus bars, meaning the main conductors to which all the current produced is carried and from them distributed to the various circuits connected therewith.

BUSBY, n. *bŭz'bi:* a high fur cap worn by hussars, artillery-men and engineers in the Brit. army.

BUSBY, *bŭz'bĭ,* Richard: famous English schoolmaster: 1606, Sep. 22—1695; b. Lutton, Northamptonshire. Educated at Westminster School, and Oxford, he was, 1640, appointed headmaster of Westminster School, which office he held till his death. He is the type of British pedagogues of the old style, alike for learning, assiduity, and the application of the birch. He was a most successful teacher, and at one time could point to no less than 16 occupants of the bench of bishops who had been educated in his school; and, altogether, he has the reputation of having 'bred up the greatest number of learned scholars that ever adorned any age or nation.' He published several works, chiefly for school use.

BÜSCH, *büsh,* Johann Georg: 1728, Jan. 3.—1800, Aug. 5; b. Alten-Weding, in Hanover: statistician; prof. of mathematics in the Hamburg gymnasium from 1756; founder and director of a notable commercial academy there 1767. His history of trade appeared 1781, his numerous writings were collected in 16 vols. at Zwickau, 1813–16, and those on commerce reprinted at Hamburg, 8 vols., 1824–27.

BÜSCHING, *bü'shing,* Antoine Fredrich: geographer: 1724, Sep. 27—1793, May 29: b. Stadthagen, principality of Schaumburg-Lippe, Germany. He studied theology at Halle, where he had the friendship of Baumgarten. In 1754, he was appointed extraordinary prof. of philosophy in Göttingen, but soon incurred the displeasure of the Hanoverian government by his religious heterodoxy, and accepted an invitation, 1761, to St. Petersburg as preacher to a Protestant congregation. In 1765, he returned to Germany, and 1766, was called to Berlin as upper consistorial councilor and director of a *gymnasium* in Berlin, where he died. Until the appearance of Büsching's *Erdbeschreibung* (first vol., Hamburg, 1754), neither Germany nor any other nation

possessed a geographical work which made any pretension to scientific treatment or completeness of execution. Changes in the political arrangements of the world have deprived the work of its original value, but it has been corrected and edited by subsequent writers. Of his other numerous publications, the most important is the *Magazin für Histoire und Geographie* (25 vols. Hamburg, 1767–93).

BUSEMBAUM, *bô'zēm-bowm*, HERMANN: 1600–1668, Jan. 31; b. Nottelen, Westphalia; theologian of the order of Jesuits. About 1640, he taught ethical philosophy at Cologne, and later, was appointed rector of the College of Jesuits at Münster. His work *Medulla Theologiæ Moralis* (1645), was celebrated as a standard authority in the seminaries of the Jesuits, though several of its propositions were condemned by the pope. It has gone through more than 50 editions. It was enlarged by the Jesuit Lacroix (1707), and re-edited, with improvements and additions, by the Jesuit Montausan 1729, and again by Alfonso de Ligorio 1757. As it was found that the work contained doctrine in favor of regicide, it was burned, by order of the parliament of Toulouse, on the occasion of an attempt made on the life of Louis XV. by Damiens, 1757. Subsequently, the Jesuits Zacharia and Franzoja of Padua wrote in defence of Busembaum's work.

BUSH, n. *bûsh* [Icel. *buskr*, a tuft of hair; *buski*, a bunch of twigs; OF. *bousche*, and *bouche*, a tuft, a wisp: Dan. *busk*, a bush: Dut. *bos*, a bunch]: a shrub or small tree; a collection of shrubs of various kinds; in the British colonies, a tract of uncultivated country covered with trees and shrubs of natural growth; in *fox-hunting*, the name applied to the fox's tail. BUSH-BEAN, the kidney bean or French bean, *Phaseolus vulgaris*. BUSH-BEATER, n. *-bēt'ĕr*, one who beats among the cover to rouse game. BUSH-FIGHTING, n. *-fīt'ĭng*, irregular warfare in a woody country. BUSH'ET, n. *-ĕt*, a copse; a wood. BUSH'MAN, n. one who lives in the forests or back settlements of a new country (see BUSHMEN). BUSHY, a. *bûsh'ĭ*, full of bushes; thick like the branches of a bush. BUSH'INESS, n. BUSH'RANGER, n. a robber, especially an escaped criminal, roaming about the woods and outlying parts of a new country. BUSH'WHACKER, familiar term in the United States during the Civil War for men in some southern states, who under pretense of neutrality were secretly lying in wait to capture or kill stragglers; a person accustomed to beat about or travel through bushes; a raw countryman; a bush-scythe. BUSH'WHACKING, the act of traveling or working one's way through bushes; hauling a boat through the bushes growing in the shallow water near the shore. TO BEAT THE BUSH, or TO BEAT ABOUT THE BUSH, to approach a matter in some indirect or roundabout way.

BUSH, n. *bûsh* [Dut. *busse;* Ger. *büchse;* Dan. *bosse*, a box]: a round open piece of metal put into sheaves of blocks to prevent wearing; a circlet of metal put into a part of a machine to lessen friction: V. to line any hole or orifice with metal. BUSH'ING, imp. BUSHING, n.: a lining for a hole, as in the hub of a wheel. BUSHED, pp. bûsht, lined with metal.

BUSH ANTELOPE, or BUSH BUCK, or BUSH GOAT: names common to a number of species of Antelope (q.v.), natives chiefly of the s. and w. parts of Africa, forming a section of the genus *Antilope*, which some naturalists have attempted to erect into a distinct genus (*Philatomba* or *Cephalopus*). They are of more compact form, shorter limbs, and greater strength, but much less agility, than the true or typical antelopes. They are remarkable for the arched form of the back. They have short, straight, or slightly curved horns, situated far back, and generally peculiar to the male sex, with usually a long tuft of hair between them. They have no tear-pits, but instead of them, a naked glandular line, formed of two series of pores, on each cheek. They frequent jungles, thick forests, and beds of reeds, and when pursued seek to escape by diving into a thicket. The common or white-backed Bush Antelope of Sierra Leone (*Antilope sylvicultrix*) is about three ft. high at the shoulder; it is a dull, heavy, awkward-looking animal; stays concealed in the thickets during the day, living singly or in pairs, and feeds in the open spaces in the early morning only. To shoot it, sportsmen place themselves on the margin of woods, and watch their opportunity as it comes out to graze. Its flesh is more esteemed than that of the more agile antelopes. Nearly 20 other species are usually ranked in this section of antelopes, among which is the *Kleene Boc* (*Antilope pygmæa*) of s. Africa, a species abundant in many parts of Cape Colony, of very small size, not more than one ft. in height at the shoulder, and with horns only about 1½ inch in length. It is a timid, gentle animal, easily domesticated. It differs from the typical Bush Antelopes in its great activity.

BUSHEAB, *bô-shĕ-âb':* low flat island in the Persian Gulf, about 11 m. from the Persian coast; lat. 26° 50′ n., long. 53° 12′ e. It is about 18 m. long, narrow, and well peopled, with a town and harbor at its western extremity. Its proper name is *Khoshaub*, signifying 'good water.'

BUSHEL, n. *bûsh'ĕl* [OF. *boissel*—from mid. L. *bussel'lus*, and *bustel'lus*, a bucket, a vessel to measure grain: comp. Gael. *bus-iall*, a sack tied up at the mouth by a thong—from *bus*, mouth; *iall*, a thong]: a measure for dry goods, such as grain, fruit, etc.; equal to four pecks. The quarter contains 8 bushels, and the bushel 8 gallons, the gallon measuring 277.274 cubic

inches, and holding 10 lbs. avoirdupois of distilled water. Hence the imperial bushel contains 80 lbs. of water, and measures 2218.2 cubic inches. The U. S. bushel contains 2,150.4 cubic inches, which is also the capacity of the Winchester bushel. BUSH'ELAGE, n. *āj*, a duty on commodities estimated by their bushel bulk.

BUSHIRE': see ABUSHEHR.

BUSH'MEN, or BOSJESMANS, *bŏs'jĕs-măn'z:* nomadic race in s. central Africa, especially in the Kalahari desert, where they subsist on game and the desert roots. They call themselves saab, or saan. In appearance the Bushmen are thin and wiry; of low stature, poor and debased when found near the Cape but of improved appearance and intelligence farther north. They do not cultivate the soil, build no huts, and do not gather round a king or chief; at one time numerous, they are now rapidly becoming extinct. In some of the mountain caves which they have inhabited, rude paintings are to be seen showing some artistic talent. Although they resemble the Hottentots (q.v.) in color and features, the relationship is by no means clear. The languages of both abound in curious and unpleasant clicking sounds, but have little or nothing else in common.

BUSHNELL, *bûsh'nel*, HORACE, D.D.: b. in Litchfield co., Conn., 1802, Apr. 14; d. Hartford, 1876, Feb. 17: theologian. He graduated at Yale Coll. 1827, was for eleven months literary editor of the New York *Journal of Commeree*, taught at Norwich, Conn., and in 1829 returned to Yale as tutor, also studying law and then divinity. He was pastor of the North Cong. Church, Hartford 1833–57, when failing health compelled his resignation. Prominent among his addresses were the Phi Beta Kappa orations at Yale, 1837, on *Prineiples of National Greatness*, and at Harvard, 1848, on *Work or Play*, with one in New York on the *Fathers of New England*, 1849. His *Christian Nurture* appeared 1847. *God in Christ* (1849), called forth a charge of heresy, of which he was acquitted: the views therein expressed were defended in *Christ in Theology* (1851), which aimed to prove the impossibility of reaching scientific accuracy in religious thought and of formulating it in human language. His later publications were *Sermons for the New Life* (1858); *Nature and the Supernatural* (1858), which has been compared to Butler's *Analogy; Charaeter of Jesus; Christ and His Salvation* (1864); *The Viearious Saerifice* (1865); *Moral Uses of Dark Things* (1868); *Women's Suffrage, the Reform Against Nature* (1869); *Forgiveness and Law* (1874). A bold thinker and vigorous writer, he occupied in America a position similar to that of Maurice and F. W. Robertson in England, and contributed more largely than any other Trinitarian to the liberalization of the prevalent orthodoxy. His writings are rich in suggestiveness and spiritual insight. He wrote much for

the *New Englander.* Dr. Bushnell declined the presidency of the Univ. of Cal., which he had helped to establish.

BUSINESS, BUSIED, BUSILY: see under BUSY.

BUSIRIS, *bū-sī'rĭs:* ancient Egyptian town, presumably built by one of the princes of the same name, in the delta of the Nile, and supposed to be close at the entrance of Elysium. Here Iris had a shrine, and the annual festival and lamentation of Osiris was celebrated. The nome or district issued small bronze coins A.D. 117, under a privilege from Hadrian. The town was destroyed by Diocletian; its name is preserved in Abusir.

BUSK, n. *bŭsk* [F. *busc;* OF. *busque,* and *bustc,* a buste for stays: OF. *busche,* a log: Icel. *bukr,* the trunk of an animal: Sp. *buche,* stomach, breast]: a thin flat piece of steel, whalebone, or wood, with which a woman's stays or bodice is made stiff in front.

BUSK, v. *bŭsk* [Icel. *bua,* to prepare to dress; *buast,* to bend one's steps; *búask,* to get one's self ready: Gael. *busg,* to dress or adorn]: to direct one's course toward; to make ready; to dress; to attire one's self; to deck. BUSK'ING, imp. BUSKED, pp. *bŭskt.*

BUSKET, n. *bŭs'kĕt* [F. *bosquet,* a thicket—from mid. L. *boscus,* a little wood]: in *OE.,* a small bush, or sprig of one. BUSKY, a. *bŭs'kī,* bushy; woody; shaded by trees.

BUSKIN, n. *bŭs'kĭn* [Sp. *borcegui;* It. *borzacchino,* a buskskin, a half boot—from Flem. *brosekin,* a buskin of leather: F. *brodequin,* bukskin]: a kind of leather of sheepskin—the Ar. *cherqui;* a kind of a half boot, lacing tight to the leg. The ancient tragedians wore bukskins (*cothurni*), often with thick soles, to add to their stature. Hence the Buskin is often put for Tragedy, as the sock [*soccus,* a flat-soled shoe] for Comedy. BUS'KINED, a. *-kĭnd,* dressed in buskins.

BUSS, n. *bŭs* [Icel. *bussa;* Dut. *buysc,* a boat: Sp. *bucha:* a vessel used mostly in the herring-fishery, especially among the Dutch; usually 50 or 60 tons burden.

BUSS, n. *bŭs* n. [Gael. *bus,* a mouth: Sp. *buz,* a kiss: L. *basĭŭm;* It. *bacio,* a kiss: F. *baiser,* to kiss]: a salute with the lips; a rude or playful kiss: V. to kiss in a rude or playful manner. BUS'SING, imp. BUSSED, pp. *bŭst.*

BUSS, n. *bŭs:* an omnibus.

BUSS, *bûs,* FRANZ JOSEPH VON: 1803, March 23—1878, Feb. 1: publicist. He was prof. of law at Freiburg from 1833, deputy to the Baden parliament 1837–46, and in 1848–49 member of the Frankfort assembly, in which he took a position ultra-catholic without being Christian, and reactionary without being

conservative.' He put forth three vols. on political science and its history in 1839, and sundry later works on political and ecclesiastical topics.

BUSSAHIR, *bŭs'sâ-hēr:* (better spelled *Bashahr*): one of the Punjab hill-states, on the lower slopes of the Himalayas 32° n. and 78° e. cross in its area). Much of it is from 7,000 to 12,000 ft. above the sea. The Sutlej flows through the country from e. to w. The dist. on the n. of the Sutlej is called Kunawur, that on the s. is Bussahir proper. The climate in the lower parts on the s. frontier is almost tropical, and there are many genial and fertile districts of mild, temperate climate; other districts are near and within the limits of perpetual snow. The vine thrives in many places, and it is supposed that some parts of this state are extremely suitable for the culture of tea, which, indeed, is cultivated to some extent. Very rich deposits of copper ore have been discovered in Kunawur, and copper-mining is prosecuted near the s.w. frontier. Principal productions are opium, grain, and woolen manufactures. The inhabitants are little advanced in civilization; many in the more northern parts have strongly-marked Mongolian features. Polyandry prevails among them, and the females left unmarried take refuge in Lamaic convents. The rajah and upper classes in the s. parts are Rajpoots, and the people generally are of Hindu race. Their observance of Hinduism, however, is very partial. The Rajah of Bussahir holds his dignity by a grant from the East India Co., made on the expulsion of the Ghoorkas 1815. Area, 3,320 sq. m.; pop. 90,000.

BUSSANG, *boo'săng*, or Bou[illegible]sa, a town of central Africa in lat. 10° 14′ N.; lon. 4° 11′ E. It is walled, and being surrounded by rocks is a place of considerable strength. The houses are irregularly placed, and thus cover a space of ground disproportioned to the number of inhabitants. The soil of the country is fertile, producing corn, yams, cotton, rice, and timber trees in great abundance. Among the wild animals are elephants, hippopotami, lions, etc. It has obtained a melancholy notoriety from the place where Mungo Park met his death in 1805. Pop. estimated at 12,000 to 18,000.

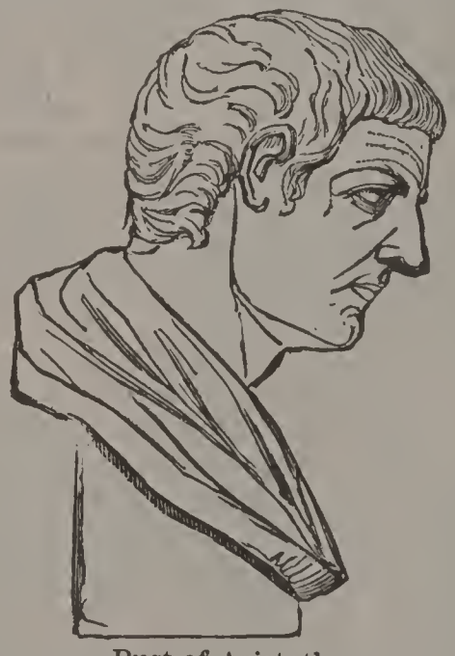
BUSSEY, *bŭz'ze*, Benjamin: 1757, Mar. 1—1842, Jan. 13; b. Canton, Mass. He served in the Revolutionary War 1775–79, became a silversmith at Dedham, and in 1782 a Boston merchant. His estate of $350,000 was left in reversion to Harvard Univ., one half for the schools of law and divinity, the other half, including several hundred acres at West Roxbury, to found a school of agriculture and horticulture, which was established 1869–70.

BUSSORA, or Bassah: see Bassora.

BUSSU PALM, *bôs'sô pâm* (*Manicaria saccifera*): *S.* American palm growing in the tidal swamps of the Ama-

zon, the only known species of its genus. The stem is only 10–15 ft. high, curved or crooked, and deeply ringed. The leaves are simple or undivided, and are the largest of the kind produced by any known palm, being often 30 ft. long, and 4 or 5 ft. wide. They are simply branched, drooping, and the fruit is of an olive color, large, hard, and three-seeded. The leaves make excellent and durable thatch, being split down the midrib, and laid obliquely on the rafters, so that the furrows formed by the veins lie in a nearly vertical direction, and serve as so many little gutters to carry off the water. The spathe, taken off entire, is used by the Indians as a bag, or the larger ones are stretched out to make caps.

BUST, n. *bŭst* [F. *buste*, the body of a man from the face to the middle—from It. *busto*, a trunk without a head—from mid. L. *busta*, a tree stripped of its branches: Icel. *butr*, the trunk of a tree]: the figure of a person showing the head, shoulders, and breast; in plastic art, a sculptural representation of the head and upper part of the human body. The earliest busts formed by the ancients were probably those heads of Mercury which, elevated on tall, square blocks of stone, received the name of Hermæ (q.v.).



Bust of Aristotle.

These hermæ were afterward frequently surmounted by representations of other divinities, such as Minerva; and as they gradually assumed more and more of the human form they passed into busts, which were made of marble, bronze, etc. But it was not till very late in the history of art that busts, in the sense of portraits of individuals, came to be used, either in Greece or Rome; and it is remarkable that neither Greeks nor Romans designated them by any special name, for the Latin word *bustum* had a quite different meaning. It was not till Alexander's time that busts were used for portraiture in Greece; and most of the Roman busts extant belong to the period of the emperors. During the learned period of Greece.

which commenced with Aristotle, portraits of men of letters formed an important department of art; and it became an object with the founders of museums and libraries to procure complete sets of them. The artists of this period exhibited remarkable ability in expressing the characters of the individuals whom they represented. In this way, we have well authenticated busts of Socrates, Plato, Zeno the Stoic, and other philosophers; of poets and orators, such as Isocrates and Demosthenes, of Athenian statesmen and distinguished women. In Rome representations of the kings, and persons of distinction belonging to the earlier period, were probably made from the *imagines majorum* which every patrician preserved in his atrium, and which were commonly made of wax. These, no doubt, were often merely fanciful representations, partly taken, it may be, from the more prominent features which belonged to the existing members of the family. The earliest well authenticated Roman B. extant, is probably that of Scipio Africanus the Elder. During the empire, busts for the most part were accurate portraits, and still furnish the means of acquaintance with the features of the emperors and of most other persons of distinction. Busts of poets and men of letters are far less frequently met with among the Romans than among the Greeks. The chief marks of the authenticity in these busts are the names frequently inscribed on them, and, where these are not found, the comparison which can be made between them and coins. Private collectors of busts were known in antiquity, as, for example, M. Terentius Varro and Pomponius Atticus. In our own time, King Louis I. of Bavaria made, in his celebrated Valhalla, probably the most remarkable existing collection of busts. The first complete collection of engravings from antique busts was made by Fulvius Ursinius in his *Illustrium Imagines* (Rome, 1569, and Antwerp, 1606). Recently, Visconti's *Iconographie Grecque* (Paris, 1811) and *Iconographie Romaine* (Paris, 1817) supply a similar collection.

BUSTAMANTE, *bôs-tâ-mân'tā*, Anastasio, M.D.: 1782–1851; b. Guadalajara: Mexican patriot. He practiced as a physician at San Luis Potosi, supported the Spanish government at first in the revolution of 1810, but soon espoused the popular cause, became a gen. of division under Iturbide and commander of the interior provinces. He was vice-pres. of the republic at the end of 1829, pres. 1830, Dec.—1832, Aug., and again 1837–41; twice defeated and banished by Santa Anna, and lived in France, England, and Italy; returned in 1845 and filled many offices usefully. He died at San Miguel de Allende.

BUSTARD, n. *bŭs'tĕrd* [F. *bistard* or *outard;* OF. *oustard*, a great sluggish fowl: L. *avis tarda*, the slugglish bird], (*Otis*): genus of birds, sometimes made the type of a family, *Otidæ*, usually ranked in the order *Grallæ* (q.v.). The general structure seems to agree best with that of the *Grallæ;* but there are points of strong resemblance to gallinaceous birds, both in the appearance and habits of the

bustards; while their power of running, and the use which they make of their wings to aid in running, indicate a relation to the *Struthionidæ*, or ostrich tribe. They differ, however, from these birds in possessing wings quite capable of flight, although even when pressed by danger they often seek to escape by running, and the great B. of Europe has been pursued and taken by greyhounds.—Bustards are birds of bulky form, with long neck and long naked legs; the toes, three in number, all directed forward, short, united at the base, and edged with membrane; the wings rather rounded; the bill of moderate length, straight, or nearly so. They are mostly inhabitants of open plains, to which all their habits are adapted.—The GREAT B. (*Otis tarda*) was at one time plentiful in some parts of England, and in the s.e. of Scotland; but it is now a very rare British bird. It is common in the s. and e. of Europe, and abounds in the wide steppes of Tatary.

Great Bustard (*Otis tarda*).

Is is the largest of European birds, the male sometimes weighing nearly 30 lbs. The female is much smaller than the male. The plumage is of a pale chestnut color on the upper parts, beautifully varied with black—much white and black on the wings, the tail tipped with white. The tail is short, spreading, and rounded. A tuft or plume about seven inches long, springing from the chin, passes backward and downward on each side, in the summer dress of the male, partly concealing a long stripe of bare skin on each side of the neck. The anatomy of the male exhibits a remarkable peculiarity in a large bag or pouch, capable of holding several pints, the entrance to which is between the under-side of the tongue and the lower mandible. The use of this bag is unknown; but it has been conjectured to be

for conveying water to the females and young, in wide arid plains. The Great B. feeds indiscriminately on animal and vegetable food, swallows frogs, mice, worms, etc., and is very fond of turnip-tops. Its flesh is highly esteemed for its flavor. It is polygamous. No difficulty is found in taming it, but all attempts to reduce it to a state of true domestication have hitherto failed, from its not breeding in the poultry-yard.—The LITTLE B. (*O. tetrax*), frequent in the s. of Europe and n. of Africa, is not half the size of the Great Bustard.—The BLACK-HEADED B. (*O. nigriceps*) is found in large flocks in the open plains of the Mahratta country. Its flesh is esteemed one of the greatest delicacies which India produces.—The KORI B. (*O. Kori*) of s. Africa, a magnificent bird, standing upward of five ft. in height, has a similar reputation as one of the best kinds of game.—Australia possesses a B. (*O. Australasianus*) somewhat exceeding the Great B. of Europe in stature, called wild turkey by the colonists of New South Wales. Its plumage is finely freckled or spotted; the prevailing color is brown. It has become comparatively rare in the more settled districts, its flesh being particularly delicate and well-flavored, but may be seen stalking majestically in the grassy plains, wherever human footsteps are still rare.

BUSTLE, n. *bŭs'sl* [Icel. *bustla*, to make a splash in the water, to bustle; *bustl*, bustle: Gael. *bustail*, puffing, blowing]: hurry and noise; great stir; rapid motion with noise; a pad used by women to expand petticoats and dress, and make them fuller at the back: V. to be very active; to stir quickly with noise. BUSTLING, imp. *bŭs'lĭng:* ADJ. active; stirring and busy. BUSTLED, pp. *bŭs'sld.* BUS'TLER, n. *-lèr*, one who.—SYN. of 'bustle, n.': hurry; haste; dispatch; speed; tumult; uproar.

BUSTO-ARSIZIO, *bôs'tō-âr-sēd'zē-ō:* town of n. Italy province of Milan, 20 m. n.w. from Milan. It is a place of active trade, and has a cotton-thread factory. Pop. 10,000.

BUSY, a. *bĭz'ĭ* [AS. *biseg*, occupation: Dut. *besig*, busy: F. *besogne;* OF. *besoigne*, business, work: Gael. *beosach*, active—from *beo*, alive]: active and lively; very closely engaged in mental or physical work; constantly and actively employed; meddling; troublesome: V. to employ constantly; to keep employed; to make busy. BUS'YING, imp. *-ĭ-ĭng.* BUSIED, pp. *-bĭz'ĭd.* BUS'ILY, ad. *-ĭ-lĭ*, in a busy manner; with an earnest business air. BUSINESS, n. *bĭz'nĕs* [OF. *busoignes*, plu. works, business]: employment; occupation; anything that demands attention; affairs: matter under consideration; something to be done; right or claim. BUSINESS-LIKE, a. as it ought to be done; thorough. BUSY-BODY, n. *-bŏd'ĭ*, a meddling person. BUSY-MINDED, a. having an active mind. TO MAKE A THING ONE'S BUSINESS, to occupy one's time wholly or chiefly with it.—SYN. of 'business': occupation; employment; engagement; avocation; trade; profession; art; office; duty; affairs; concern; matter; calling.

BUT, conj. *bŭt* [AS. *butan;* Dut. *buiten*, without: contraction of Eng. *be-out*]: something more to supply; unless; yet; nevertheless; than; otherwise than: AD. only: PREP. except: INT. expressing surprise or dissent: N. the outer room of a house of two apartments where the inner room is entered from the outer. BUT AND BEN [AS. *butan*, without; *binnan*, within]: without the house and within; in *Scot.*, applied to the outer and inner rooms of a house of two apartments.

BUTCHER, n. *bûch'ér* [F. *boucher;* OF. *bocher*, originally one who slaughters he-goats—from *boc*, a goat: It. *beccaro*—from *becco*, a goat—*lit.*, a slaughterer of bucks or goats, goats' flesh forming a common flesh meat in former times]: one who slaughters animals for food; one who cuts up and sells meat or flesh; a cruel man; one who delights in blood: V. to kill or slaughter animals for food; to murder with unusual cruelty. BUTCH'ERING, imp. BUTCH'ERED, pp. *-érd.* BUTCH'ERY, n. *-ér-i*, great slaughter; murder with great barbarity; place where animals are slaughtered. BUTCH'ERLY, ad. *-lĭ.* BUTCH'ERLINESS, n. BUTCHER-MEAT, n. the flesh of animals slaughtered for the table. BUTCHER'S-BROOM, n. the plant knee-holly, the branches of which are used by butchers for brooms; the *Ruscus acūlĕātus*, ord. *Lilĭācĕæ.* BUTCHER-BIRD, the shrike, a bird which kills and impales insects and smaller birds, on thorns and the like (see SHRIKE).—SYN. of 'butchery': massacre; carnage; slaughter; murder.

BUTCHERS' BROOM (*Ruscus*): genus of plants of the nat. ord. *Liliaceæ*, with male and female flowers on sepa-

Butchers' Broom (*Ruscus aculeatus*).
a, branch, with flowers; *b*, a berry; *c*, a seed; *d*, a female flower.

rate plants, a perianth of six leaves, filaments united, one style, and the fruit a berry. The common B. B. (*R. aculeatus*) is a shrubby, or almost shrubby evergreen plant, with

a biennial stem, 1–3 ft. high, sending out many short branches and ovate alternate sharp-pointed false leaves of the same substance as the branches, the flowers minute and arising from the disk of the false leaves, solitary; the berries red, almost as large as wild-cherries, and of a sweetish taste. It is common in many parts of the s. of Europe, and in the s. of England in woods and hedges. The English name is derived from the use made of the plant by butchers, to sweep their blocks. It grows well under trees or shrubs, and can often be advantageously introduced for ornamental purposes. The root was formerly much used in medicine. It is aperient and diuretic.—*R. hypophyllum*, native of Italy, had formerly considerable reputation as a stimulant of the uterus.

BUTE, *būt:* island in the Firth of Clyde, Scotland, separated from the coast of Argyle by a narrow, winding strait, called the Kyles of Bute, mostly less than a mile wide; about 6 m. from the w. coast of Ayrshire, and 8 m. n. of Arran. It is about 16 m. long, of irregular breadth; area 60 sq. m. The surface to the n. is high, rugged, and barren; in the centre and s., it is low and undulating, and comparatively fertile. The highest point rises 875 ft. The coast is rocky, and has some bays. The island has several small lakes. The climate is milder than in any other part of Scotland, and though moist, less so than on the w. coast generally; hence it is much resorted to by invalids. In the s. the soil is sandy; toward the n. clay predominates. Most of the arable land is under tillage, and agriculture is in a good state; chief crops are oats, turnips, and potatoes. The principal town is Rothesay. Most of the island belongs to the Marquis of Bute, whose beautiful seat, Mount Stuart, is about 4 m. s. from Rothesay. Among the antiquities of B. are Rothesay Castle, Kames Castle, Kilmorie Castle, St. Blaine's Chapel, Dungyle, a remarkable vitrified fort on a high crag on the s.w. coast, and the Devil's Caldron, a circular erection, the original purpose of which is not known. B. and the neighboring isles were for many centuries subject to the Norwegians. Pop. 10,998.

BUTE, John Stuart, third Earl of: 1713–92. About 1737, he attracted the favorable notice of Frederick Prince of Wales, who made him one of his lords of the bedchamber. After the death of the prince, he became groom of the stole to his son, afterward George III., over whose mind he obtained strong influence. In 1761, Mar., he was appointed one of the principal secretaries of state; and 1762, May 29—1763, April 8, he was prime minister. His government is memorable only as one of the most unpopular that ever held office in Britain, its fundamental principle being the supremacy of the royal prerogative, of which the executive government were merely the humble servants. Lord B. was given to scientific pursuits, especially botany, and showed himself a liberal patron of literature and art. He married the only daughter of Lady Mary Wortley Montagu.

BUTEA, *bū'tē-a:* genus of plants of the nat. ord. *Legu-*

minosæ, sub-ord. *Papilionaceæ,* remarkable for the great length of the *standard* of the flower, and having a compressed one-seeded pod, membranaceous at the apex. The best known species are *B. frondosa* and *B. superba,* natives of India; the former very widely diffused through that country, generally appearing as a sort of shrub in the neighborhood of villages, but in the jungles growing into a small tree. These trees present a gorgeous sight when covered with racemes of large, deep scarlet flowers. They have trifoliate leaves, with roundish leaflets, velvety beneath. They yield a resinous exudation, in the form of lurid red tears, often covering the twigs, which is one of the kinds of Lac (q.v.) brought to the market in India. The juice of the tree is not red, and the lac is supposed to be elaborated by insects, but of what species is unknown.—*B. frondosa* is called the *Dhak* tree in India. The bark and roots are very fibrous, and the fibre is used for calking boats. The flowers, called *Teesoo* or *Keesoo,* yield a beautiful yellow or orange dye.

BUT-END, n. *bŭt'ĕnd:* the blunt or larger end: see under Butt.

BUTLER, n. *bŭt'lėr* [F. *bouteillier*—from *bouteille,* a bottle: Norm. F. *butuiller*—from *butuille,* a bottle—from mid. L. *butĭc'ŭla,* a small bottle or flagon: Sp. *boteria,* the store of barrels (see Butt 2)]: the servant or official in charge of the buttery or collection of casks; a servant in wealthy families who has the charge of the plate, liquors, etc. But'lerage, n. *-lėr-āj,* very ancient hereditary duty belonging to the crown, otherwise called the *prisage* of wines; taken notice of in the Great Roll of the Exchequer in the time of Richard I., still extant. Under this right the crown could take two tuns of wine from every ship (English or foreign) importing into England 20 tuns or more, one before, and one behind the mast; which, by charter of Edward I., was exchanged into a duty of two shillings for every tun imported by merchant strangers, and called butlerage, because paid to the king's butler. But'lership, n. the office of butler.

BUTLER, *bŭt'lėr,* Alban: 1710–1773, May 15; b. Appletree, Northampton; Rom. Cath. writer. He was educated at Douai, and became prof. there. He was for some time chaplain to the Duke of Norfolk. When he died, he was head of the English College at Et. Omer. His great work is the *Lives of the Fathers, Martyrs, and other Principal Saints* (5 vols., 4to; Paris 1745); often republished, one edition being edited by Butler's nephew, Charles Butler (1750–1832), known as a lawyer and a voluminous author on legal and theological subjects.

BUTLER, Amos William, American ornithologist: . Brookville, Ind., 1860, Oct. 1. He received his edu-

cation at the University of Indiana and in 1895 was elected president of the Indiana Academy of Science. Since 1897 he has been secretary of the Indiana State Board of Charities. He has been general secretary of the American Association for the Advancement of Science from 1891 and has published *The Birds of Indiana* and lesser works.

BUT'LER, Andrew Pickens, American politician: b. Edgefield District, S. C., 1796, Nov. 7; d. near Edgefield Court-house, 1857, May 5. He was admitted to the bar in 1819, and in 1824 was elected to the legislature as the representative of his native district. In 1831, a period marked by the apprehended collision of South Carolina with the Federal government, on the nullification issue, he was elected colonel of a regiment of cavalry. In 1833, still a member of the legislature, he was made a judge of the courts of general sessions and common pleas. Subsequently, when a change was made in the judiciary system, he was transferred to the supreme bench of the State, where he continued until 1846, when he was elected a senator in Congress. Soon after taking his seat in this body, he was appointed chairman of the Judiciary Committee. One of his earliest speeches was against making Col. Benton lieutenant-general of the army. The Kansas question, the action of the naval retiring board, the abolition question, and all others affecting the peculiar interests of South Carolina, and the general welfare of the South, engaged him in frequent debate, in which he always took a conspicuous part. His last speech was in reply to Mr. Sumner, and in defense of South Carolina.

BUTLER, Benjamin Franklin: 1795, Dec. 15—1858, Nov. 8; b. Kinderhook, N. Y.; descendant of Oliver Cromwell. He was Martin Van Buren's law student and partner 1817–21; dist. attorney of Albany co. 1821–25; a reviser of N. Y. statutes, member of assembly, U. S. attorney-gen. 1831–34; acting sec. of war 1836, Oct.—1837, Mar.; U. S. dist. attorney for s. dist. of N. Y. 1838–41; a founder of Univ. of City of New York, and law prof. there. The Kansas–Nebraska Bill drove him from the Democratic party. He died in Paris, France; his life was written by W. L. Mackenzie.

BUTLER, Benjamin Franklin, ll.d.: 1818, Nov. 5—1893, Jan. 11; b. Deerfield, N. H.: lawyer. He graduated at Waterville Coll. (Colby Univ.), Me., 1838; was admitted to the bar 1840; and began practicing in Lowell, Mass., in the following year, rapidly gaining distinction as a criminal lawyer. An inherited taste for military life led him to join the state militia as a private early in his career, and he was promoted through the various grades to the rank of brig.gen. He also entered political life as a democrat. In 1853 he was elected a state representative and member of the state constitutional convention, and in 1859 a state

senator. In 1860 he was chosen a member of the democratic national convention which first met at Charleston, and with a majority of the delegates from Mass. withdrew from the adjourned session at Baltimore, mainly because the African slave-trade had been approvingly advocated there. The same year he was an unsuccessful candidate for gov. Two days after Pres. Lincoln's first call for troops (1861, Apr. 15) he took possession of Annapolis with a part of his militia brigade, another part having garrisoned Fortress Monroe the day previous, thus with his own brigade, aided by the 7th regt. of N. Y. militia, preventing the seizure of the national capital and of Fortress Monroe by the rebels. Having re-established railroad communication with Washington *via* Annapolis, and placed the 7th N. Y. and the 8th Mass. regts. in the former city, he took possession of Baltimore without opposition May 13. For his prompt and effective movements Pres. Lincoln commissioned him maj.gen. of vols., May 16, and assigned him to the command of Fortress Monroe and the dept. of e. Va. While there a large number of fugitive slaves, who had been working in Confederate earthworks, came within his lines, and when their masters claimed them as property he declared: 'This property is useful to the enemy in war, *ergo*, contraband,' and refused to give them up. He captured Forts Hatteras and Clark, N. C., Aug.; recruited in Mass. an expedition for operations in the Gulf of Mexico and the Mississippi river; made a landing on Ship Island 1862, Mar. 23; went up the Mississippi Apr. 17; and, after David G. Farragut (q.v.) had virtually captured New Orleans, Apr. 24, took possession of the city May 1. He remained in command till Dec. 16 following, instituting and enforcing beneficial sanitary measures, compelling rich rebels to help support the poor, arming free negroes, hanging William Mulford for hauling down the U. S. flag on the mint, issuing a celebrated order (No. 28) aiming to repress the exuberant disloyalty of some women and to protect officers and soldiers from insults which they could not resent, and being proclaimed an outlaw by Jefferson Davis. In 1863, Nov., he was placed in command of the dept. of Va. and N. C.; 1864, Nov., was sent to New York to preserve order during the election; the next month conducted an expedition against Fort Fisher, near Wilmington, N. C., which failed through lack of proper naval co-operation; and was soon afterward removed by Gen. Grant. He resigned his commission; returned home; was member of congress as a republican 1866–75 and 1877–79; was manager on the part of the house of representatives in the impeachment of Pres. Johnson 1868; was defeated for gov. as a republican 1871 and as a greenbacker 1878–9; elected as a democrat 1882; defeated for re-election 1883; and as the greenback and anti-monopoly candidate for pres. of the United States

received 133,825 votes 1884. While gov. he preferred sensational charges against the management of the Tewksbury almshouse, which a legislative investigating committee pronounced unsustained; and Harvard Univ. withheld from him the honorary degree of LL.D., which it customarily bestows on each gov. of Mass. In 1889, May, in delivering a eulogy on Admiral Farragut in Boston, Butler spoke of 'his brave officers, all save one, a high officer who ran away,' and a few days afterward acknowledged that the officer he meant was Admiral David D. Porter (q.v.). This revival of Butler's frequently repeated charges of cowardice against Porter at New Orleans aroused the indignation of the latter's friends, and for several weeks the newspapers contained sprightly correspondences and interviews in which the principals and their friends sought to vindicate the integrity of each other from mutual charges. Butler received the degree LL.D. from Williams College 1863, and published *Butler's Book* (Boston 1892).

BUTLER, CHARLES, English Roman Catholic, historian: b. London, 1750, Aug. 15; d. there 1832, June 2. He was nephew of the Rev. Alban Butler (q.v.). He was called to the bar in 1791, and was the first Roman Catholic who was admitted, after the passing of the relief bill of that year. He wrote *Horæ Biblicæ*, giving a history of the original text, early versions, and printed editions of the Old and New Testaments, and also of the *Koran*, *Zend-Avesta*, and the *Edda*. This first appeared in 1797, and was followed by *Horæ Juridicæ Subsecivæ*, a connected series of notes respecting the geography, chronology, and literary history of the principal codes and original documents of the Grecian, Roman, feudal, and canon law. He continued and completed Hargrave's *Coke Upon Littleton;* supervised the sixth edition of Fearne's *Essay on Contingent Remainders;* wrote a history of the geographical and political revolutions of Germany, and a *Historical and Literary Account of the Formularies, Confessions of Faith, or Symbolic Books of Roman Catholic, Greek, and Principal Protestant Churches.* During the last 25 years of his career he principally devoted his pen to the vindication of the Roman Catholic Church. He published numerous biographies of eminent Roman Catholic divines and authors; continued his uncle's *Lives of the Saints*, and produced *Historical Memoirs of the English, Irish, and Scottish Catholics.* When Southey's ultra-Protestant *Book of the Church* appeared, it was replied to in Butler's *Book of the Roman Catholic Church*, which gave rise to six answers on the Protestant side, two of which were responded to by Butler. His *Reminiscences* appeared 1822–7. As a constitutional lawyer his reputation was very high.

BUTLER, CLEMENT MOORE, American Episcopal cler-

gyman: b. Troy, N. Y., 1810, Oct. 16, d. Philadelphia, Pa., 1890, March 5. He was a graduate from Trinity College, Hartford, in 1833, and from the General Theological Seminary in 1836. He was successively rector of churches in Boston and Washington, D. C., and of Grace Church in Rome, Italy, and from 1864 to 1884 professor of ecclesiastical history in the Episcopal Theological School in Philadelphia. He was the author of *The Book of Common Prayer Interpreted by Its History* (1846); *Old Truths and New Errors* (1850); *Saint Paul in Rome* (1865); *Inner Rome* (1866); *Manual of Ecclesiastical History* (1868–72).

BUTLER, Lady Elizabeth Southerden Thompson: b. Lausanne, Switzerland, about 1844; married, 1877, Sir William Francis Butler (q.v.). She received her education in Italy, came to England in 1870, and first exhibited at the Royal Academy in 1873. Her *Roll-Call* (1874) gained her a great reputation, and was purchased by Queen Victoria. Among her other pictures, which deal almost exclusively with military subjects, are: *Missing* (1873); *28th Regiment at Quatre Bras* (1875); *Balaclava* (1876); *Inkerman* (1877); *Defense of Rorke's Drift* (1881); *Scotland Forever* (1881); *Foreat Etona* (1882); *the Charge of the Scots Greys at Waterloo* (1882); *Evicted* (1890); *Camel Corps* (1891); *Halt in a Forced March* (1892); *Dawn of Waterloo* (1895); *Steady the Drums and Fifes* (1897); *Tent Pegging in India* (1902); etc. She has written *Letters from the Holy Land* (1903).

BUTLER, Howard Russell, American landscape artist: b. New York, 1856, March 3. He graduated from Yale in 1876 and the Columbia Law School in 1881, and studied art in New York and Paris. He organized the American Fine Arts Society and was its first president.

BUTLER, James (Duke of Ormond), English statesman: b. London, 1610, Oct. 19; d. Kingston Hall, Dorsetshire, 1688, July 21. When Strafford become lord-lieutenant of Ireland, Butler was made commander of the army, but as it consisted of only 3,000 men, he could do little more than keep the enemy in check, and was obliged to agree to a cessation of hostilities; after which, having been created a marquis, he was appointed lord-lieutenant. On the ruin of the royal cause he retired to France. After the execution of Charles he returned to Ireland with a view of raising the people; but on the landing of Cromwell returned to France. While abroad he exerted himself to further the restoration of Charles; and when that event was brought about by Monk, returned with the king. Before the coronation he was created Duke, and assisted at that ceremony as lord high-steward of England. In 1662 he was again appointed lord-lieutenant of Ireland, which country he restored to comparative tranquillity, and was an

active benefactor to it by encouraging various improvements, particularly the growth of flax and manufacture of linen. On the exile of Lord Clarendon, his attachment to that nobleman involved Butler in much of the odium attached to him, and although on his recall from Ireland, nothing, on the most rigorous inquiry, could be proved against him, he was removed by the machinations of Buckingham. For six years he was deprived of court favor, but at length was again appointed lord-lieutenant of Ireland, which place he held during the remainder of the reign of Charles, but soon after resigned, his principles not suiting the policy of James. He died at his seat in Dorsetshire, leaving behind him the character of a man who united the courtier and the man of honor and integrity better than any nobleman of the time.

BUTLER, JOHN, American royalist leader in the American Revolution: b. Connecticut; d. Niagara, 1794. He became a leading resident of Tryon co., N. Y.; commanded the Indians in the Niagara campaign (1759) and in the Montreal expedition (1760). At the outbreak of the Revolution he sided with the Tories and became deputy superintendent of Indian affairs. In 1776 he organized a band of marauders, chiefly Indians, and fought the battle of Oriskany (1777); in July 1778, he commanded at the brutal Wyoming massacre. In 1780 he took part in Sir John Johnson's raid on the Mohawk settlements. At the end of the war he fled to Canada, and was appointed Indian agent.

BUTLER, *bŭt'ler*, JOSEPH, Bishop of Durham, England: 1692–1752, June 16; b. Wantage, Berkshire, where his father kept a shop. With a view to the ministry of the Presb. Church, he attended a dissenting acad. at Tewkesbury, Gloucestershire. At the age of 22, he gave proof of high metaphysical ability in a letter to Dr. Samuel Clarke, usually appended to that celebrated writer's *a-priori* demonstration, to which it offers some objections. About this time he made up his mind to join the Church of England, and 1714, Mar., entered Oriel College, Oxford. Soon afterward he took orders. In 1718, he was appointed preacher at the Rolls Chapel, where he preached those remarkable sermons which he published in 1726. The first three, *On Human Nature*, constitute one of the most important contributions ever made to moral science. The scope of the reasoning is, briefly, that virtue is consonant with, and vice a violation of, man's nature. In 1725, Butler was presented to the rich benefice of Stanhope, in the county of Durham, to which he removed in the following year. Here he resided in great retirement till 1733. His friend Secker, the archbishop, desired to see him promoted to some more important position, and mentioned his name once to Queen Caroline. The queen thought he had been dead, and asked Abp. Blackburne if it were not so.

'No madam,' said the abp.; 'but he is buried.' In 1733, Butler became chaplain to his friend Lord Chancellor Talbot, and at the same time a prebendary of Rochester. In 1736, he published the great work of which the germs were contained in his three sermons, and which has entitled him, in the eyes of his eloquent disciple Chalmers, to be called 'the Bacon of theology.' The leading aim of the *Analogy* is to show that all the objections to revealed religion are equally applicable to the whole constitution of nature, and that the general analogy between the principles of divine government, as revealed in the Scriptures, and those manifested in the course of nature, warrants the conclusion that they have one author. Soon after the publication of this work, Butler was appointed clerk of the closet to the queen, who greatly prized his conversation. In 1738, he was made Bp. of Bristol; in 1740, Dean of St. Paul's; and in 1750, he was translated to the see of Durham. He lived only to make one visitation of his diocese. His 'charge' on the occasion, in which he pointed out, with characteristic depth of insight, the importance of a due maintenance of the externals of religion, as a means of keeping alive the thought of it in the minds of the people, subjected him to much censure as betraying a tendency to Roman Catholicism —a charge not now deemed worthy of serious notice. Butler's private character was that of a Christian; grave and judicious, he was at the same time meek and generous. His intercourse with his clergy and people was frank and humane; his episcopal treasures were wisely and munificently distributed, as not his own, and no anxious legatee looked with hope to his death. He d. at Bath, and his remains were buried in Bristol Cathedral. His works, notwithstanding a dry and uninteresting style, have gone through numerous editions. The best is that edited with a life, etc., by Fitzgerald.

BUTLER, Josephine Grey, English reformer and philanthropist: b. Milfield, Gloucestershire, about 1828; d. 1906, Dec. 30; married George Butler, afterward Canon Winchester, 1852. She was prominent in efforts for the higher education of women, and for moral reform, and published: *Life of John Grey of Dilston; Life of Catherine of Sierra; Recollections of George Butler; The Lady of Shunem; Personal Reminiscences of a Great Crusade; Prophets and Prophetesses; Nature Races and the War; Silent Victories; The Hour Before the Dawn; Government by Police; The Constitution Violated; Women's Work and Women's Culture; Life of Oberlin; A Voice in the Wilderness.*

BUTLER, Matthew Calbraith: an Amer. military officer; b. 1836, Mar. 8, near Greenville, S. C.; received a classical education at the Edgefield Academy, and 1854, Oct., entered the South Carolina College; left that institution before graduating and studied law in Stone-

NICHOLAS MURRAY BUTLER,
President of Columbia University.

lands, near Edgefield Court house; was admitted to the bar 1857, Dec. He began practice in Edgefield Court house, and in 1860 was elected to the Legislature of South Carolina. After the civil war broke out he joined the Confederate army as captain of cavalry in the Hampton Legion; was promoted through the regular grades to be major-general. In the battle of Brandy Station, 1863, June 9, he lost his right leg. In 1866 he was re-elected to the South Carolina Legislature; in 1870 was candidate for Lieutenant-Governor; and in 1877–95 he held a seat in the U. S. Senate. He was commissioned a Major-General of Volunteers for the war with Spain, 1898, May 28; and was one of the U. S. commissioners to supervise the evacuation of Cuba.

BUTLER, Nicholas Murray, American educator; b. Elizabeth, N. J., 1862, April 2. He was graduated at Columbia University in 1882; took a special course in Berlin and Paris in 1884–5; and was then called to Columbia University, where he was assistant in philosophy, 1885–6; tutor, 1886–9; and adjunct professor 1889–90; and dean of the faculty of philosophy, 1890–2. He was a founder and the first president (1886–91) of the New York College for the Training of Teachers, now a part of Columbia University, and as member of the New Jersey State Board of Education (1887–95) introduced manual training into the public school system of that State. On 1902, Jan. 6, he was unanimously elected president of Columbia University to succeed Seth Low, then mayor-elect of New York. He has edited *The Educational Review; The Teachers' Professional Library; The Great Educators Series; The Columbia University Contributions to Philosophy and Education;* and the *Monographs on Education in the United States,* which formed a part of the exhibit of the United States bureau of education at the Paris Exposition of 1900, and St. Louis 1904, and published a volume of miscellaneous essays, addresses, etc., entitled *The Meaning of Education* (1898).

BUTLER, Samuel: 1612–80; b. Strensham, Worcestershire, England: poet. His father was a farmer in that place, and said to be a person of some education. Young Butler, after acquiring the rudiments of his education at home, was placed at the college school at Worcester. His progress was rapid, and he proceeded to one of the universities. After finishing his education, he was appointed clerk to T. Jeffreys, Esq., justice of the peace, and in his leisure hours applied himself to the study of music and poetry. He afterward entered the household of the Countess of Kent, which he left, and went to live with Sir Samuel Luke in the same county. After the king's restoration, he was made sec. to the Earl of Carberry, which office he held till 1661. About this time, Butler married a Mrs. Herbert, a lady of good family and some property, which, how-

ever, was afterward lost by bad investments. He published the first part of *Hudibras* 1663, and its reception at court was immediate and triumphant. It received all the favor Charles could spare from his spaniels and his mistresses, and he deigned even to garnish his royal conversation with its wit. The courtiers took up the fashion, the coffee-houses and taverns followed, and finally the mob went into raptures, in imitation of its betters. *Hudibras* was pirated within four weeks of its publication. The king had wit enough to see the merit of the work, but he lacked generosity to relieve the necessities of the writer. There seems no reason to believe that Butler's palm ever tingled to the touch of royal pension or gratuity. Poverty is almost the only thing in Butler's life that one is certain of. In 1664, he published the second part of his book, and a third part appeared 1678. He died in Rose Street, Covent Garden, and while some say that he starved from pride, all agree that at his death he was very poor.

Hudibras is a kind of metrical *Don Quixote;* and if the work of Cervantes stands at the head of its class in the literature of Spain, *Hudibras* occupies the same place in the literature of England. The Puritans are the subjects of Butler's derision, and King Charles must have felt that the poet avenged for him the battle of Worcester. The weight, compression, and plenteousness of the wit is wonderful. *Hudibras* is like a mass of crystals; every point flashes. It is beyond any other book, of wit 'all compact.' Butler thinks in witty couplets, he argues in them, he spears his foes with a jest, he routs and chases them into oblivion with unextinguishable laughter. His best things have become proverbs. His mass of wit has been grated down into common speech; particles of it may be found any day glittering in the talk of English plowmen and artisans.

BUTLER, Samuel, English author and composer: b. Langar, 1835, Dec. 4; d. London, 1902, June 19. He was educated at Shrewsbury School and Cambridge University, and with Henry Festing Jones composed many gavottes, figures, etc., and the cantata of *Narcissus.* He was also an artist of merit, and for several years exhibited at the Royal Academy. He is best known, however, as a brilliant, original writer in more than one field, and as a master of irony had few equals and still fewer superiors among his contemporaries, in this particular more nearly approaching Swift than anyone else. His published books include *A First Year in Canterbury Settlement* (1863); *Erewhon, or Over the Range,* his most remarkable work, with the exception of *Erewhon Revisited; Fair Haven, an ironical defense of Christianity* (1873); *Life and Habit* (1877); *Evolution, Old and New* (1879); *Unconscious Memory* (1880); *Alps and Sanctuaries of Piedmont and the Canton Ticino* (1881); *Luck or Cunning as the Means*

of Organic Modification (1886); *Ex Veto* (1888); *Life of Dr. Samuel Butler of Shrewsbury and Bishop of Lichfield* (1896); *The Authoress of the Odyssey* (1897); *The Iliad of Homer, Rendered into English Prose* (1900); *Erewhon Revisited* (1901).

BUTLER, WILLIAM, American army officer: b. Prince William co., Va., 1759; d. Columbia, S. C., 1821, Nov. 15. He served in the Revolution in Pulaski's corps; afterward, under Pickens, Lee, and Greene; won fame as commander of the Mounted Rangers; and, after the war, became (1796) major-general of militia. He was a member of the Convention which adopted the Federal Constitution; helped frame the South Carolina constitution; was a member of congress (1801–11); and commanded the South Carolina troops in 1812.

BUTLER, WILLIAM ALLEN, American lawyer and man of letters: b. Albany, N. Y., 1825, Feb. 20; d. Yonkers, N. Y., 1902, Sept. 9. He was a son of Benjamin F. Butler (1795–1858, q.v.), and was graduated at the New York University in 1843 and began the practice of law. He wrote in 1857 *Nothing to Wear*, a satirical poem, which became famous almost immediately and was not only reprinted in England but translated into French and German. His other publications include a volume of his collective poems (1871); *Mrs. Limber's Raffle* (1876); *Oberammergau; Domesticus* (1886).

BUTLER, WILLIAM ARCHER: 1814–48; b. Annerville, near Clonmel, Ireland: religious and philosophical writer. He was originally a Rom. Catholic, but subsequently became a Protestant, and studied at Trinity College, Dublin, where he was appointed prof. of moral philosophy 1837. The principal work on which his reputation is based, is the *Lectures on the History of Ancient Philosophy*, edited with notes by W. Hepworth Thomson (Cambridge, 1856, 2 vols.); remarkable for great learning, eloquence, and depth of judgment. Besides his lectures, there have appeared, *Sermons*, with a memoir by the Rev. Thomas Woodward (Dublin, 1849); *Letters on the Development of Christian Doctrine* (Dublin, 1850); *Letters on Romanism* (Lond. 1854).

BUTLER, SIR WILLIAM FRANCIS, British general: b. Tipperary co., Ireland, 1838, Oct. 31. He was educated at Dublin, and joined the army in 1858 as ensign in the 69th Regiment. In 1863 he became lieutenant, and in 1874 was promoted to the rank of major. He served on the Red River expedition of 1870–1, and about the same time was sent on a special mission to the Saskatchewan territories. He accompanied the Ashantee expedition in 1874, and in 1879 acted as staff officer in Natal. He also served in Egypt in 1882, and held important commands under Lord Wolseley in the Sudan campaign of 1884–5. From 1890 till 1893 he was in command at Alexandria, and in 1892 was raised to the rank of major-general. He has since had command of

the 2d Infantry Brigade at Aldershot, and since 1896 of the southeastern district at Dover. He was made K.C.B. in 1886. In 1898–9 he was commander-in-chief of the forces in Cape Colony. He has published *The Great Lone Land; A Narrative of Travel and Adventure in the Northwest of America* (1872); *The Wild North Land* (1872), the story of a winter journey across northern North America; *Akim-Foo* (1875), a story of the Ashantee war; *Far Out* (1880); *Red Cloud, the Solitary Sioux* (1882); *The Campaign of the Cataracts* (1887); *Charles George Gordon* (1889); *Sir Charles Napier* (1891); and *Sir George Colley* (1899). In 1877 he married Elizabeth Southerden Thompson the famous artist. See BUTLER, LADY ELIZABETH.

BUTLER, WILLIAM MORRIS, American physician: b. Maine, 1850. He was educated at Hamilton College and the New York College of Physicians and Surgeons; has been professionally connected with several homœopathic hospitals, and has been professor of nervous diseases at the Metropolitan Postgraduate School of Medicine, New York. He has published *Home Care for the Insane.*

BUTLER, WILLIAM ORLANDO, American general: b. Jessamine co., Ky., 1791; d. Carrollton, Ky., 1880, Aug. 6. He was about devoting himself to the legal profession when the War of 1812 broke out. Enlisting as a private soldier in Capt. Hart's company of Kentucky volunteers he gained distinction in the battles at Frenchtown and the river Raisin. Subsequently he took a conspicuous part in the battles of Pensacola and New Orleans, was brevetted major, 1814, Dec. 23, acted as aide-de-camp to Gen. Jackson from 1816, June 17, to 1817, May 31, when he tendered his resignation, resuming for the next 25 years the profession of the law. From 1839 to 1843 he served as a representative in congress from that district, in the interests of the Democratic party. Nominated as a candidate for governor of Kentucky in 1844, he was defeated by the influence of Clay. Created major-general 1846, June 29, he led with great spirit the daring charge at Monterey, and although wounded on that occasion, still remained for several months with the army. On 1848, Feb. 18, he succeeded Gen. Scott in command of the army in Mexico. The most important operation during his tenure of this office was the defeat of Padre Jarauta and his guerrilla forces by Gen. Lane. His military administration in Mexica was brought to a close on 1848, May 29, when he announced the ratification of the treaty of peace. After his return to the United States he was nominated in 1848 by the Democratic party as candidate for the vice-presidency. He was the author of *The Boatman's Horn and Other Poems.*

BUTLER, ZEBULON, American military officer: b. Lynne, Conn., in 1731; d. Wilkesbarre, 1795, July 28.

He served in the French and Indian war, and in the Revolutionary War also. He commanded the garrison at Wyoming Valley at the time of the massacre of 1778, July 3.

BUTLER, Pa.: a borough and county-seat of Butler co., situated on the Conequessing Creek, and on the Pennsylvania, the Pittsburg & W., the Buffalo, R. & P., and the Bessemer & L. E. R.R.'s. It is the centre of a region having oil and natural gas. The chief industry is glass manufacture, and there are also flouring mills, a large planing mill, and several oil-well supply manufactories. Pop. (1910) 20,728.

BUT'MENT: see ABUTMENT.

BUTMENT-CHEEK, n. *bŭt'mĕnt-chēk:* the part of a mortised timber surrounding the mortise, and against which the shoulders of the tenon bear.

BUTOMUS, *bū'tō-mus:* genus of aquatic plants, of which one species, *B. umbellatus*, is frequent in ditches and ponds in many parts of Europe. It is popularly called Flowering Rush, and is one of the plants to which the praise has been assigned of being the most beautiful in the British flora. The leaves are all radical, 2–3 ft. long, linear, triangular, their sharp edges sometimes cutting the mouths of cattle, whence the generic name (Gr. *ox-cutting*). The scape, or flowering stem, is longer than the leaves, terminating in a large umbel of rose-colored flowers, readily distinguished from those of all other British plants by having nine stamens, six in an outer, and three in an inner row.

BUTT, v. *bŭt* [Dut. *botten;* F. *bouter;* OF. *boter*, to push, to thrust: It. *botto*, a blow: Gael. *butadh*, a push, a thrust]: to strike with the head like a goat or a ram; to touch at the end [F. *buter*]: N.—*lit.*, that part of a body which pushes or touches first; a push or thrust given by an animal with its head; a thrust in fencing. BUT'TING, imp. BUT'TED, pp. BUTT-HINGE, or BUT-HINGE, a hinge formed of two plates and interlocking projecting pieces which are connected by a pintle. BUTT-JOINT, a point in which the pieces come square against each other, endwise. In iron-work the parts are welded, and the term is used in contradistinction to a lap-joint or weld. BUTT-WELD, a weld in which the edges are square-butted and jammed against each other, and then welded; a jump-weld. TO COME FULL BUTT AGAINST, to come upon suddenly, so as to make a sounding blow. BUTT-END OF A THING [Icel. *butr*, the trunk: F. *bout*, end: W. *pwt*, a stump: Ger. *butt*, a short thick thing]: the striking or thick end of a thing; the thick end, as of a plank in a ship; the thick end of a rifle, a fishing rod, etc. BUTT, n. a mound of turf in a field to support a target for shooting at; the prick in the middle of a target [F. *but*]; the object of aim. BUTTS, n. strips at the edges of a plowed field; hides; the

places where targets are erected; a musketry or a rifle range. BUTTLANDS, waste ground. BUTT AND BUTT, joining end to end without overlapping. ABUT, v. to *butt* on or touch at the end. TO MAKE A BUTT OF A PERSON, to make him a mark for the jests of the company.

BUTT, n. *bŭt* [F. *botte;* OF. *boute,* a butt, a leather bottle, a boot; mod. Ger. *boutis,* a cask: Sp. *bota,* a wine-skin—*lit.,* the entire skin of an animal in the form of a bag] a wooden receptable for liquors; a large barrel; a *butt* of wine contains 126 gallons; a *butt* of beer, 108 gallons.

BUTT, *bŭt,* ISAAC: 1813–80 (or '78) b. Glenfin co., Donegal, Ireland. He graduated at Trinity Coll., Dublin, 1835, became Whately prof. of political economy there 1836, and was called to the bar 1840. He opposed O'Connell in 1843, but defended Smith O'Brien and others in the state trials of 1848, and several Fenians in 1865. He sat in parliament for Harwich 1850–52, for Youghal 1852–65, was returned for Limerick 1871 as a home-ruler, and was long a leader of that party. His *Chapters of College Romance* appeared in the *Dublin Univ. Mag.,* which for a time he edited. He wrote also a *History of the Kingdom of Italy,* 1860, and a *Treatise on the New Law of Compensation to Tenants in Ireland,* 1870.

BUTTE, n. *bŭt* [F. *butte,* a small rising ground—from OF. *bute,* the fem. of *but,* an aim, a mark]: in the western parts of North America, detached hills and ridges which rise abruptly, intermediate in height between hills and mountains; applied sometimes to mountains, as to the Downieville Buttes, Cal., almost 9,000 ft. high. *Note.*—The preceding three entries are etymologically connected.

BUTTE, *būt,* Montana: city, county-seat of Silverbow co., on the Great N., the Northern P., and the Union P. Railways. It is on the high plateau between the Rocky Mountains and the Bitter Root Mountains, 5,800 ft. above the level of the sea. The place was first settled as a gold placer camp in 1863, laid out as a town in 1866, and grew rapidly after the successful opening of quartz mining in 1875. It was incorporated by the territorial legislature in 1879, and re-incorporated in 1888, having been made the county-seat of Silverbow co. in 1881. The city is well-built, the more imposing structures being the city hall, courthouse and jail, opera house, the Federal building, and a fine public school building, completed at a cost of $125,000. The Montana State School of Mines is located here, the public school system is excellent, and there is a public library of more than 35,000 volumes. It spends annually about $200,000 for schools, and about $50,000 each for the fire, police, and street-cleaning departments. The municipal government consists of a mayor, elected

biennially, and a city council. The mining interests are the chief industries It is the largest mining town in the world, employing many thousands of persons in this industry alone. Copper is the chief production, although there are valuable deposits of silver and gold. The Great Anaconda copper mine is located here, and many other valuable mining properties are within a radius of a few miles of the city. The copper production alone is about one-half that of the entire United States, and the total mineral output is estimated at more than $40,000,000. Butte is the trading and jobbing center for southern and western Montana; it has an extensive trolley system; gas and electric lights; national and other banks, daily and weekly newspapers, schools, churches, etc. Notwithstanding the comparatively small area covered by the mines, the deposits are so great as to be almost inexhaustible, and for years to come they will sustain the growing importance of the place. A number of manufacturing interests have grown up in connection with the mines, which add a degree of permanency to that section; and the surrounding country has developed agriculturally to a degree far beyond the expectations of the earlier settlers. The dry and healthful climate, the splendor of the natural scenery, and that fascination of the mountain region all exercise their influence in assuring the future of the city. Pop. (1910) 39,165.

BUTTER, n. *bŭt'tèr* [Bav. *buttern*, to shake backward and forward: Dut. *boter*, butter; *botern*, to make butter: L. *but'yrum;* Gr. *bou'turon*, butter—from Gr. *bous*, a cow; *tūrŏs*, cheese]: an oily or fatty substance got from milk or cream by churning or shaking it; in *chem.*, sometimes applied to substances resembling butter: V. to cover or spread with butter, as bread. BUT'TERING, imp. BUT'TERED, pp. *-tērd.* BUTTER-BOAT, a table article for holding melted butter. BUTTERINE, or n. BUTTERIN, *bŭt'ĕr-ĭn*, a substitute for butter, first manufactured in France, now extensively produced in Holland and America. It is composed of OLEOMARGARINE (q.v.), amalgamated with milk, to which is sometimes added a small proportion of real butter. BUT'TERMILK, n. the milk left after the butter has been separated. BUT'TERY, a. *-tēr-ĭ*, like butter; n., a pantry; in Eng. universities, the room from which refreshments are served to the students. BUTTER-BUR, a plant having large leaves and pinkish flowers; the *Petasītĭs vulgārĭs*, ord. *Compos'ĭtæ.* BUT'TERCUPS, n. plu., bright yellow wild flowers in the form of a cup—so named from their color; a popular but indefinite name of various species of *Ranŭn'cŭlus* (q.v.), especially *R. ācris*, *R. rēpĕns*, and *R. bulbōsus*, ord. *Ranŭn'cŭlācĕæ.* BUT'TERFLY, n. [old Dut. *boterschijte*—from the resemblance of the excrement of certain species to butter]: a common insect with large wings, so called from the color of a

yellow species; any of the diurnal *Lepidop'tĕră*. BUTTERFLY-SHELL, any shell of the genus *Voluta*. BUTTERFLY-VALVE, a double clack-valve, each leaf of which is hinged to a bar crossing the passageway. There are butterfly pump-valves and butterfly throttle-valves. BUT'TERMAN, n. a vendor of butter. BUTTER-TREE, a tree whose seeds yield a substance closely resembling butter; the *Bassĭa butyrācĕa* of India, or *B. Parkĭī* of Africa, also *Shēă* butter-tree, ord. *Sapotācĕæ*. BUTTERWORTS, wild marsh plants, the genus *Pinguic'ŭlă*, ord. *Lentib'ulācĕæ*.

BUTTER, *bŭt'ter:* fatty substance present in the milk of the mammalia and capable of being extracted from it. In ancient times the Hebrews seem to have made copious use of butter as food; but the Greeks and the Romans used it only as an ointment in their baths, and it is probable that the Greeks obtained their knowledge of the substance from the Scythians, Thracians, and Phrygians, while the Romans obtained it from Germany. In s. Europe, at the present time, butter is very sparingly used; and in Italy, Spain, Portugal, and s. France, it is sold by apothecaries as a medicinal agent for external application. The amount of butter in cows' milk (q.v.) is about 4 per cent., though the kind of pasture, quantity of milk, and general condition influence the relative quantity of the several ingredients of milk. In the extraction of butter, the milk is allowed to cool, and the cream which rises to the surface is skimmed off, and put into a large, deep, earthenware vessel, where it lies for several days till enough has been collected for a *churning*. (For swifter methods of obtaining the cream by separators, see DAIRY). Difference in treatment makes difference in butter. The butter and cream of Devonshire, England, long famed for superior richness, owe this in greater part to the mode of manipulating the milk, and not to the special character of that fluid, or to the richness of the pastures in those districts. The milk in Devonshire is not allowed to cool slowly, as elsewhere, but is at once placed in large deep pans, and carefully heated. A scum quickly rises, which is pushed to the side; and whenever the bubbles of steam appear the milk is removed and allowed to cool in the ordinary way, when a good deal of the milk thickens to the consistence of butter and is skimmed off as the celebrated *Devonshire clouted cream*. In England, the butter of Epping and Cambridge is highly esteemed; the Dutch butter in a salted form, is very largely consumed; of one-third of the foreign butter consumed in Great Britain, the largest supply is imported from Holland. France stands next, then Denmark and the United States.

In order to separate the butter from milk recourse is always had to the process of agitation in CHURNS (q.v.). The principle involved in all forms of this apparatus is

the thorough agitation of the contents, so as to cause the rupture of the minute fat globules present in the milk, and the incorporation of kneading of these ruptured fat globules into larger or smaller masses of butter. The cream is strained through cloth into the churn, to remove any foreign matter; and the agitators being set in motion, the friction of the movement, combined with the admission of air, and the chemical changes that it induces, raises the temperature of the whole contents. At one time, it was thought that one great object of the agitation was the admission of the oxygen of the air, which, becoming thoroughly incorporated with constituents of the milk, combined therewith, and, as a consequence, led to the separation of the butter. It is found, however, that butter can be obtained from milk by mere agitation, without the admission of the oxygen of the air. At the same time, in the ordinary way of churning, oxygen does act a subordinate part by combining with the sugar of the milk, and forming lactic acid, which in its turn *sours* the milk and separates therefrom the caseine (q.v.)—cheese-matter—in minute clots or flakes, yielding what is commonly called *sour* or *buttermilk*. The process of churning must be conducted at a medium rate. If too quickly performed, the butter is soft and frothy, and is said to be *burst*, while, when too slowly made, it is highly tenacious, strong tasted, and badly flavored. When all the butter has *come*, which is known by the particles agglutinating into irregular masses, the butter is *made* by taking the lumps, and well washing and kneading them on a wooden board in a tub of pure spring-water till all the buttermilk has been expressed; it is then divided into the requisite size of lumps, fashioned into rolls, or molded into forms, and often stamped with some device. In the making up of the butter, the hands of the operator must be scrupulously clean, and be free from the slightest taint of soap. Persons who are subject to moist hands should never knead butter, as it is very liable to be contaminated by the slightest foreign matter, especially animal secretions; and it is better always for the operator to wash the hands with water containing some oatmeal before commencing. So important is this source of contamination regarded in milk factories, that every endeavor is made to avoid using manual labor in working the butter, and *butter-workers* are commonly used. When newly prepared, the butter is called *fresh* or *sweet* butter, and is of a yellow color, which is deeper as the pasture on which the cows have been fed is richer, and hence the poorer kinds of butter are oftener artificially colored with Arnotto (q.v.).

A large quantity of the butter sent into market has more or less common salt added, for the purpose of preserving it. For use within a week or two, the proportion of common salt employed is about half an ounce to two pounds of butter, though, where it has to be kept

for some time, as much as one ounce of salt to one pound of butter is used. The incorporation requires to be carefully and dexterously done, so that the resulting material may be uniform; and the better plan is to add only a portion of the salt at a time, and to knead and reknead the butter till the whole is thoroughly mixed. When the less amount of salt has been employed, the result is *powdered* butter, and the larger quantity yields *salt* butter. Much of the latter is closely packed in small wooden firkins or *kits*, and occasionally in stoneware, and sent into market. Great care must be taken to have these kits, and indeed to have every vessel used in the preparation, as clean or *sweet* as possible. Constant rinsing with cold water, and scaldings with boiling water, are resorted to. Attention must likewise be given to the air of the apartments in which the operations are carried on, as tainted air is very injurious.

The adulterations liable to be present in butter are an undue proportion of salt and water, and these run up occasionally to upward of 33 per cent. or one-third of the total weight. Another adulteration is the presence of lactate of zinc, derived from the milk being placed in zinc pails and basins, from the impression that by some imaginary electrical influence an increase in the amount of cream will be the result; but though ths is not attained, yet the milk tending to form lactic acid, the latter attacks the zinc vessel and forms lactate of zinc, which dissolves in the milk, and thereby contaminates it, imparting an unpleasant taste, and, when present in larger quantity, leading to violent spasmodic vomiting. When butter is allowed to get old, it becomes rancid, and tastes and smells disagreeably. To some extent an acid is formed called Butyric Acid (q.v.). For the use of butter in diet, see FOOD and NUTRITION.

BUTTER, in Chemistry: generically any substance of the consistence of butter. Thus it is used to designate palm, cocoanut, shea, and nutmeg oils. It is applied also to certain metallic substances which have an oily aspect and consistence resembling melted butter; thus we have butter of antimony, bismuth, zinc, and tin.—Butter of Antimony is a thick, dense, oily compound, produced by acting upon the native sulphuret of antimony (SbS_3) by concentrated hydrochloric acid (HCl) and heat, when the oily chloride of antimony ($SbCl_3$) is formed: see ANTIMONY.

BUTTER-BUR (*Petasites vulgaris*), a composite plant, with large rhubarb-like leaves and purplish flowers, growing by the side of streams, allied to colt's-foot. The flowers appear before the leaves.

BUTTER-COLOR, a preparation employed to color butter and its imitations. Annatto was formerly largely used for this purpose, but is now superseded by coal-tar colors and other coloring substances. Owing to the small quantities used in coloring butter they are quite harmless.

BUTTER, Rock: a mineral which may be regarded as a variety of Alum (q.v.)—an iron alum, appearing as a pasty exudation from rocks that contain alum or its constituents, particularly alum-slate and other schistose rocks. It occurs at Hurlet alum-work, near Paisley, Scotland, and in a number of places on the continent of Europe. It is not unlike butter in color, varying from yellowish white to sulphur yellow. It is rather greasy to the touch, and is easily broken in pieces.

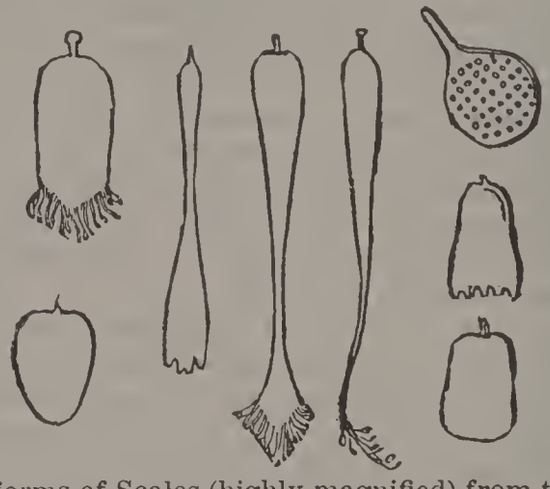
BUT'TERFIELD, Daniel, American soldier: b. Utica, N. Y., 1831, Oct. 18; d. Cold Cpring, N. Y., 1901, July 17. At the outbreak of the Civil War he was colonel of the 12th New York Militia. He served in the Peninsular campaign, and under Pope and McClellan in 1862. At Fredericksburg he commanded the 5th Corps, and at Chancellorsville and Gettysburg was chief of staff. He served as chief of staff to Hooker at Lookout Mountain, and Ringgold, and Pea Vine Creek, and commanded a division at Buzzard's Roost, Resaca, Dallas, New Hope Church, Kenesaw, Lost Mountain, and other battles. He was brevetted major-general in the regular army. He resigned in 1869, and became chief of the United States sub-treasury in New York. He was author of *Camp and Outpost Duty* (1862). He is buried in the West Point military cemetery, an elaborate and costly marble tomb marking the spot.

BUTTERFIELD, John: 1783–1869, Nov. 15; b. Helderberg, N. Y.: expressman, and originator of the American Express Co. Beginning as a stage-driver, by thrift and self-education he became owner of nearly all the stage-coach lines in w. N. Y., with extensive interests in a line of steamers on Lake Ontario and the St. Lawrence river. When railroads began to supplant stage lines, he interested himself in their extension, and at about this time founded the American Express Co., in whose affairs he wielded a powerful influence until his death. Realizing the importance of the telegraph, he aided greatly in projecting it, building the Morse line between Buffalo and New York. As pres. of the Overland Mail Co. he contracted with the government, 1858, for the carrying of mail from the Missouri river to the Pacific slope. He greatly assisted in the development of the city of Utica, where he had his residence, and where he died.

BUTTERFIELD, William, English architect: b. 1814, Sept. 7; d. London, 1900, Feb. 25. He first attained distinction by the introduction of color into ecclesiastical buildings with the aid of bricks and mosaic. Among the notable structures designed by him are St. Augustine's College at Canterbury; Keble College, Oxford; All Saints' Church, Margaret Street, London; and the cathedral at Melbourne.

BUT'TERFISH: see Gunnel.

BUTTERFLY: the common English name of all the diurnal lepidopterous insects, corresponding with the genus *Papilio*, as originally defined by Linnæus, but forming many genera in the most recent entomological systems. Butterflies have great similarity in almost all respects to other lepidopterous insects (see LEPIDOPTERA), but are even more distinguished by brilliancy of coloring, which in butterflies also belongs to the under as well as the upper side of the wings, while the beauty of moths and hawk-moths appears chiefly on the upper side. Accordant with this is the further peculiarity, that almost all butterflies, when at rest, usually hold their wings erect, the under side being thus chiefly exhibited; while the other lepidopterous insects, when at rest, hold their wings in a horizontal or somewhat inclined position, and some have them wrapped round the body. Butterflies are also the only lepidopterous insects which have no spines,



Various forms of Scales (highly magnified) from the Wings of Butterflies.

bristles, or hooks on the margins of their wings, by which the second wing on each side can be attached to the first, but both when flying and at rest, have all their wings quite separate. The manner in which the scales of the wings are imbricated gives those of butterflies a smoother appearance than those of moths and hawk-moths. The antennæ of butterflies are generally simple, slender, and elongated, and terminated by a little club. Their caterpillars have always 16 feet (see CATERPILLAR). The pupa or chrysalis is angular; seldom enveloped in a cocoon; generally suspended by the tail, by means of a silky substance, often to a leaf or twig, but sometimes supported by bands around the middle; and generally exhibits more or less of that golden coloring from which both the names *aurelia* [Lat. *aurum*] and *chrysalis* [Gr. *chrysos*] are derived.

Butterflies are found in all parts of the world; they are to be seen during the sunshine of the brief summer extracting nectar from the flowers even of Greenland and Spitzbergen, but they are most numerous in the warmest regions; where, however, many of them live chiefly in the shade of moist foliage, in woods and jungles. Dr. Hooker, describing the scenery on the banks of the Great

Runjeet in the Sikkim Himalaya, says, that 'by far the most striking feature consisted in the amazing quantity of superb butterflies, large tropical swallow-tails, black, with scarlet or yellow eyes on their wings. They were seen everywhere, sailing majestically through the still hot air, or fluttering from one scorching rock to another, and especially loving to settle on the damp sand of the river edge, where they sat by thousands, with erect wings, balancing themselves with a rocking motion, as their heavy sails inclined them to one side or the other, resembling a crowded fleet of yachts on a calm day.'

Butterflies have no small power of wing; some of them, indeed, of which the wings are comparatively thin and delicate, are inferior in this respect, and have a sort of zigzag flight; but others soar in the air with a steady and continuous motion. Short-lived as they all are generally believed to be, some of the tropical species perform wonderful migrations; concerning which, however, nothing but the fact is yet well known. 'Frequently,' says Sir James Emerson Tennent in his work on *Ceylon*, 'the extraordinary sight presents itself of flights of these delicate creatures, generally of a white or pale yellow hue, apparently miles in breadth, and of such prodigious extension as to occupy hours and even days uninterruptedly in their passage, whence coming no one knows, whither going no one can tell.'

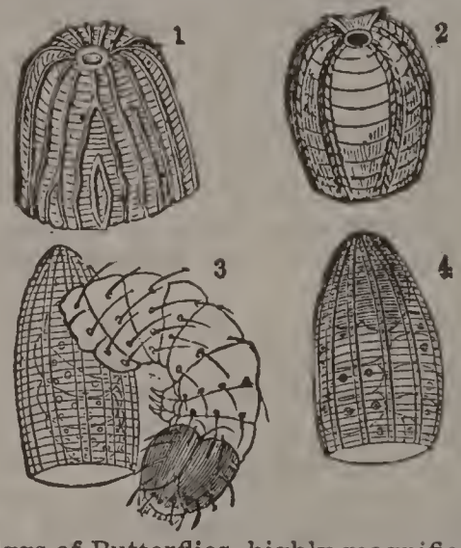
The number of species of B. is very great, and the arrangement of them has been found difficult, chiefly upon account of the great similarity in all important respects which prevails among them all. They are divided, however, into two well-marked sections, of which the first is characterized by having only a single pair of spurs or spines on the *tibiæ* (or fourth joints of the legs), placed at their lower extremity; while in the other section, the tibiæ of the hinder legs have two pair of spurs, one pair at each extremity. This distinction, seemingly unimportant in itself, is accompanied by other differences. The second section of butterflies may be regarded as forming a sort of connecting link between butterflies and hawk-moths. A few British species belong to it, but the species are generally tropical, and some of them, found in tropical America, are remarkable for their rapidity and power of flight, and for the migrations which they perform, besides being among 'the most splendid insects in creation,' a resplendent green, inimitable by art, relieving the velvet black of their wings, and varying with every change of light. The beautiful iridescence of the wings of these and many other butterflies is owing to the peculiar position of the scales.

Some groups of butterflies are remarkable for the imperfect development of the first pair of legs, so that they are generally described as having four legs instead of six.

The eggs of butterflies are deposited on the plants, the leaves of which are to supply the food of the caterpillars. In cold and temperate climates, the eggs deposited in autumn are not hatched till the following spring; but it is believed that many species produce several broods in a

year, as the eggs in summer may be hatched in a few days. The caterpillars of each species are generally confined to some particular kind of plant, the leaves of which they devour; their ravages are well known, but the excessive increase of their numbers is in part restrained by many enemies, and by none more than by the ichneumons (q.v.) and other insects which deposit their eggs in them, and the larvæ of which feed on them. The annexed cut represents a common species of B., with its larva and pupa; for an account of B. transformations, see INSECT TRANSFORMATIONS.

Butterflies vary in size from less than an inch to almost a foot across the expanded wings. The largest species are tropical. Some of the species are very widely distributed: *Cynthia cardui*, of which the caterpillar feeds on the leaves of thistles, is found not only throughout



Eggs of Butterflies, highly magnified:

1. Egg of Queen of Spain Fritillary (*Argynnis Lathonia*); 2. Egg of Peacock Butterfly (*Vanessa Io*); 3. Larva of Large Garden White Butterfly (*Pieris Brassicæ*), in the act of bursting from the egg; 4. Egg of some insect, ready to hatch, showing the head and curved body of inclosed caterpillar through the transparent envelope.—These illustrations are from Westwood's treatise on British Butterflies.

Europe, but in Egypt, Barbary, Senegal, Cape Colony, Madagascar, China, Java, Australia, Brazil, and N. America, being, in fact, one of the most widely distributed of all insects. The geographical limits of some other species appear very restricted. The diversity of coloring is almost endless, but a prevalence of certain hues, or of certain modes of the disposal of them, is observable throughout large groups. The caterpillars of many species are variously furnished with spines, those of others have long fleshy prominences, horny at the tip, probably intended as means of defense. The hinder wings of many butterflies are curiously prolonged into tail-like appendages, one or more on each wing, which vary in form, being sometimes long and linear, sometimes broad and widening toward the extremity.

Butterflies are known chiefly as objects of admiration and of pleasing contemplation, enhancing the charms of the most delightful weather, and always associated with the

BUTTERFLY.

1. Amblypodia Amantes.
2. Ornithophera Pompeus.
3. Morpho Cypris.
4. Ornithophera Priamus.
5. Papilio Hector.

most lovely scenes; or—it must be added—as a cause of annoyance by the ravages of their caterpillar young in fields and gardens. There is, however, one small species (*Euplæa humata*) which affords a supply of food to some of the wretched aborigines of Australia. Butterflies of this species congregate in such vast numbers on the masses of granite in the mountains, that they are collected by simply making smothered fires under the rocks, in the smoke of which they are suffocated. Bushels of them are thus procured, and they are baked by placing them on the heated ground, the down and wings removed, and the bodies made into cakes which resemble lumps of fat. The months of November, December, and January are quite a season of festivity from the abundance of this food. See CABBAGE BUTTERFLY: CAMBERWELL BEAUTY: PURPLE EMPEROR, etc.

BUTTERFLY FISH: see BLENNEY.

BUTTERFLY WEED, *bŭt'tĕr-flī wēd*, or PLEURISY ROOT (*Asclepias tuberosa*, see ASCLEPIAS): plant found in all parts of the United States, which has considerable reputation for the medicinal virtues of its root. The root is large, formed of irregular tubers or spindle-shaped branches, externally yellowish brown, internally white, with a somewhat acrid, nauseous taste when recent, merely bitter when dried. It yields its properties to boiling water, and is administered in the form usually of a decoction, sometimes of a powder. It is diaphoretic and expectorant, and has been found useful in the commencement of pulmonary affections, in rheumatism, and in dysentery.—The stem of the plant is erect and hairy, with spreading branches; the leaves oblongo-lanceolate, alternate, hairy, and somewhat crowded; the flowers orange-yellow, forming numerous umbels.

BUT'TERICK, EBENEZER, American pattern maker: b. Sterling, Mass., 1825; d. Brooklyn, N. Y., 1903, March 31. In early life he was a tailor's apprentice, and in 1859 set up in business for himself in Fitchburg, Mass., and shortly after began experiments in pattern-making, the result of which was the invention of the tissue paper dress-pattern. He removed to New York in 1864, and founded subsequently the Butterick Company, retiring from business in 1881.

BUT'TERINE: a substance prepared in imitation of butter, from animal or vegetable fats. The fat is first freed from all impurities, and by heat converted into oleine. The oleine is then transferred to a churn containing a small quantity of milk and churned into butterine. Lastly, it is colored in imitation of butter. Freshly prepared, it is sweet and palatable, and when spread on bread or cold toast is but slightly inferior to a fair quality of butter. The process has attained such perfection in the matter of manufacture in the United States that it takes an expert to distinguish it from genuine butter, and laws have been passed compelling

tradesmen to label each package containing it so that no one may be deceived. See OLEOMARGARINE.

BUTTERIS, n. *bŭt'tĕr-ĭs*, or BUTTRICE, n. *bŭt'trĭs* [F. *boutoir*, a currier's knife, a butteris—from *bouter*, to thrust]: a farrier's tool for paring horses' hoofs.

BUTTERMILK, *but'ter-mĭlk:* the form of milk from which the butter or oily matter has been abstracted: see BUTTER. Buttermilk contains the caseine, sugar, and salts of ordinary milk, and is deficient only in oily matters. It is therefore nutritious, and is largely used in Ireland and Scotland as an article of food, with porridge and with potatoes. It may be drunk *ad libitum*, is a very agreeable cooling beverage, useful certain in febrile and inflammatory conditions. In recent years its use has greatly extended in the United States.

BUTTERMILK FALLS: cascade of Oatka creek, Le Roy, Genesee co., N. Y.; 90 ft. high. Another Buttermilk Falls is near West Point, N. Y., on Bog Meadow Creek.

BUTTERNUT, or WHITE WALNUT: see WALNUT.

BUTTER TREE: name given to several tropical trees, of different natural orders, the fruits of which yield concrete fixed oils, having the appearance and used for the purposes of butter. The butter trees of India and Africa belong to the genus *Bassia* (q.v.), of the nat. ord. *Sapotaceæ;* the butter trees of Guiana and Brazil to the genus *caryocar* (q.v.), of the nat. ord. *Rhizobolaceæ*. The Oil-palms (q.v.), and the *Cocos butyracea* (see COCOA-NUT), also may be regarded as butter trees, though not generally receiving that name.

BUTTERWORT, *but'tĕr-wĕrt* (*Pinguicula*): genus of plants of the nat. ord. *Lentibulariaceæ* (q.v.), distinguished by a two-lipped calyx, the upper lip trifid, the lower bifid: a spurred corolla, two-lipped and gaping, the upper lip arched; and a globose germen. The species are small plants with only radical leaves, found in the bogs and marshes of different quarters of the world. Some of them possess much beauty when in flower, particularly *P. grandiflora*, a rare native of the s. of France and of Ireland. The common Butterwort (*P. vulgaris*) is abundant in the n. parts of Britain and of Europe. It has the power of coagulating milk. The Laplanders pour reindeer milk, warm from the animal, upon the leaves of this plant, instantly strain it, and set it aside for two or three days, till it acquires the consistence of cream, and some degree of acidity, when it is with them a favorite article of food. A little of it in this state will produce the same effect on warm reindeer milk which was at first produced by the leaves of the plant. The origin of the English name Butterwort is sometimes referred to the power of coagulating milk, sometimes to the peculiar sliminess of the leaves.

BUT'TERWORTH, HEZEKIAH. American story writer

and poet: b. Warren, R. I., 1839, Dec. 22: d. there 1905, Sept. 5. He was editor of the Youth's Companion, 1871–4. He published many popular juvenile stories and travels, including *Zig-Zag Journeys* (1876–1890); *Songs of History: Poems and Ballads upon Important Episodes in American History* (1887); *The Wampum Belt, or the Fairest Page of History* (1896); *A Knight of Liberty; The Patriot Schoolmaster; Poems for Christmas, Easter, and New Year; The Boyhood of Lincoln; Boys of Greenway Court; In Old New England; Traveler Tales of China; Over the Andes; Great Composers; South America;* and many others.

BUTTERY, n. *bŭt'ẽr-ĭ* [a corruption of *butlery* or place for *bottles:* Sp. *boteria,* the store of wine in a ship kept in *botas* or leather bags (see BUTLER and BOTTLE)]: a store for drinkables—originally for storing casks and jars of liquor; the room where provisions are laid up; a place in colleges and schools from which provisions are served out: ADJ. of or pertaining to the provision store. BUTTERY-BAR, or -HATCH, the half-door across which provisions are handed out.

BUTTISHOLZ, *bôt'tiss-hōlts:* village of Switzerland, canton of Lucerne, 11 m. n.w. from the city of Lucern. Near to Buttisholz is a large mound called the English Barrow, because here are buried 3,000 Englishmen, followers of De Couey, son-in-law of Edward III. of England, who, while devastating the cantons were defeated and killed by Swiss peasants 1376.

BUTTMANN, *bût'mân,* PHILIPP KARL: 1764–1829, June 21; b. Frankfort-on-the-Maine: one of the most distinguished philologists of modern times. He studied at Göttingen under Heyne, and became, 1789, asst. in the Royal Library in Berlin, and rose successively to be sec. and librarian (1811). He held at the same time (1800–08) a professorship in the Joachimsthal Gymnasium in Berlin, which he afterward exchanged for a professorship in the newly founded univ. of that city. Buttmann is known by his Greek grammars, the *Griech. Grammatik* (Berl. 1792; 21st ed. by his son, Alexander B., 1863), and an abridgment of it, *Griech, Schulgrammatik* (4th ed. 1862); both have been translated into English. His *Lexilogus* (translated by Fishlake), and *Ausführliche Griech. Sprachlehre,* or Larger Greek Grammar, which has gone through several editions, are designed for scholars. In his *Mythologus* he has collected his essays on the myths of the ancients.

BUTTOCKS, n. plu. *bŭt'tŏks* [Dut. *bout,* the leg or thigh of an animal, from the large knobbed head of the thigh bone; *boutje,* a little gigot—from *butt,* the thick end]: the rump, or protuberant part of the body behind; the convexity of the hinder part of a ship. *Note.*—Skeat says *buttock* is merely a dim. of *butt,* an end: OF. *bot,* F. *bout,* by adding *ock.*

BUTTON, n. *bŭt'tn* [F. *bouton,* a bud, a button—from

bouter, to put, to push: W. *both*, a boss; *botwm*, a button—*lit.*, the thing pushed out making knobs on plants]: a small piece of wood or metal, etc., shaped, as it were, somewhat like a bud; the bud of a plant; a small round knob or disk used for fastening parts of the dress together; a small mass: V. to fasten with a button. BUTTONING, imp. *bŭt'nĭng*. BUTTONED, n. *bŭt'tnd*. BUTTON-HOLE, the slit in which the button is caught. BUTTON-HOOK, a hook by which a button is passed through the button-hole. BUTTON-MOLD, or -MOULD, n. *-mōld*, a disk of bone, wood, or metal, to be covered with fabric to form a button. BUTTON-TREE, the *Conocarpus*, a genus of the order *Combretaceæ*, tropical trees or shrubs. BUTTON-WOOD, called also [U. S.] sycamore, *Platanus occidentalis*. NOT WORTH A BUTTON, of no value whatever, or of very little.

BUTTON: well-known appendages to dress, used for fastening or for ornament; also a sort of oblong latch moving upon a pivot in the middle, for fastening the lids of boxes, doors of presses, etc.; also, technically, the mass of fused metal found at the bottom of a crucible or cupel, after fusing or assaying. It is here treated as an appendage to dress. The history of button-making is in many ways remarkable. Dating no further back as a trade of any importance than the reign of Elizabeth, it has undergone several extraordinary changes, produced chiefly by the ever-varying fashions in dress, but also by some simple, though ingenious inventions, as well as by foreign competition. In Great Britain, Birmingham has always been the principal seat of the button-manufacture. In the early part of the 19th century the cloth-covered button was introduced to take the place of those made of metal. In 1825, was effected the apparently trivial but really ingenious improvement of making buttons with a canvas tuft instead of a metal shank, by which both the button-holes and the garment itself were less subject to injury. A further alteration, patented 1837, was a mode of covering the button with silk, having a pattern in the centre, the demand for which was at one time so great, that sixty looms were employed in London on the special material required. In 1841, the old Dorsetshire wire and thread button was replaced by the 'three-fold linen button,' still considered by housewives indispensable for underclothing, since neither washing nor mangling destroys it. Of these, one firm in Birmingham, employing about 400 hands, can turn out from 10,000 to 15,000 gross weekly. Birmingham has some 160 button manufactories.

Other materials have been much used. Buttons made of hoof, under the name of 'horn buttons,' were for many years extensively manufactured at Birmingham and sent to all parts of the world. This trade is now insignificant, and what remains of it is in French hands. Tweed clothing and its imitation fabrics have, through

the necessity of matching their various colors, led to the making of buttons of vegetable ivory (q.v.), which can be readily turned in the lathe, and dyed of various colors. More than 20 tons of it, valued at from £25 to £30 per ton, are weekly consumed in Birmingham in making buttons, and it is largely used for the same purpose in France and Germany.

The trade in 'pearl buttons,' made of mother-of-pearl shells, has long been a leading branch, and employs a greater number of hands than any other. Metal buttons, not relatively so important as formerly, have never ceased to form a prominent section of the trade. They include all sorts for uniforms, trouser buttons, fancy buttons which are gilt, stamped, chased, or enamelled, and many cheap varieties in iron and other metals for export. Numerous kinds of composite buttons also are partly of metal. Glass buttons are made to a considerable extent in Birmingham, but more largely in Bohemia and Paris. Porcelain buttons, an English invention, are now made almost exclusively in France. Vulcanite (q.v.) buttons are largely made in the United States, where the manufacture of various kinds of buttons has now become very extensive. As to other materials which are possible for this use, it is difficult to name one from which buttons have not been made.

In the process of making metal buttons, circular discs, called 'blanks,' are first cut out of sheet brass or other metal by means of fly-presses, worked usually by girls. The fly-press consists of a vertical iron screw with a triple thread, to which screw is attached a horizontal arm, bending downward at the end to form a handle. A punch attached to the press rises and falls with the motion of this handle, and rapidly cuts out the blanks. When large quantities of one pattern are required, a self-feeding, self-acting machine is used, which cuts out the blanks in rows at one blow, turning them out at the rate of 2,000 gross per day. After being annealed the blanks are next made convex by a blow from a stamp. The shanks are formed of wire by a separate machine, which cuts off pieces, and bends them into loops of the required form. When these are soldered on, the buttons are dressed on a lathe. They are then gilded and burnished; some, however, are only lacquered; and some, though gilt, are finished in a dead or frosted style.—'Shell' buttons are those with a convex face, a flat or convex back, and hollow. These are made of two blanks, that forming the face being larger than the back to which the shank is attached. These blanks are pressed into the required shape by dies worked in the fly-press, and then, by another die, the edge of the larger blank is lapped over the smaller, and thus attached without soldering. Livery and other buttons having a device in strong relief are stamped by a die placed in a stamping-press: see STAMPING OF METALS.

In making covered buttons, a metal blank is punched, and its edge is turned up by a die in a fly-press; then a smaller metal blank is punched with a hole in the middle, and of such size, that, when flat, it shall fit into the up

turned edge of the first: this perforated blank, or *collet,* is next pressed into a concave or dished shape. Two cloth blanks—the face one of silk, and the other for the tuft of thin canvas—are now punched, one considerably larger than the front metal blank, the other somewhat smaller; the larger cloth blank is laid upon the flat face of the metal blank, which is filled with a disc of mill-board or paper, and its edges turned over; these edges are covered by the smaller cloth, and then the collet laid upon them with its concavity toward the cloth. They are now all pressed together in a sort of die or mold, by which means the collet is flattened and spread out, while the upturned edge of the metal blank is turned forcibly over it, thus securing the collet, and with it the cloth which is strained tightly on the face, and its edges bound between the blank and the collet, so that the whole is firmly held together. The linen-covered button for underclothing, above referred to, is formed of a single brass ring with a groove or canal on one face. Into this the edges of the two round linen blanks are placed, so that when the edges of the groove are pressed firmly down, the button is entirely covered with linen.

Buttons with holes, technically called 'four-holes,' 'three-holes,' and 'two-holes,' when of pearl-shell, wood, bone, or ivory, are cut with a tubular saw, turned separately in a lathe, and drilled. When of metal, the blanks are punched, then stamped in dies to the required form; the holes are punched, and 'rymered,' to round the sharp edges that would otherwise cut the thread.—Glass buttons are made usually by taking a rod of glass of any color, softening the end by heat, and pressing it into a mold, each half of which is fixed to one limb of a pair of pincers. The shank is placed into a hole in the mold before the melted glass is inserted.

According to an estimate a few years ago the artisans—a large proportion females—employed in the button manufactures of Birmingham, England, was as follows:

Making metal buttons of all kinds	1,200
" covered buttons, including linen	1,500
" pearl buttons	2,000
" vegetable ivory buttons	700
" other kinds, as glass, horn, bone, wood, etc.	600
Total	6,000

Probably about 1,000 more are employed in London and elsewhere in Great Britain. Before the war with Germany, about 20,000 persons were employed in France. Germany is a still greater producer, the cheaper kinds of fancy buttons made in the Rhenish provinces of Prussia, the glass buttons of Bohemia, and the pearl buttons of Vienna being more extensively exported than those of any other country. Buttons of various kinds are made on a large scale in the United States, though this country still imports them largely from Europe.

BUTTON, *but'tn,* Sir THOMAS: explorer: sailed with two vessels in 1612, passed through Hudson Strait, reached the

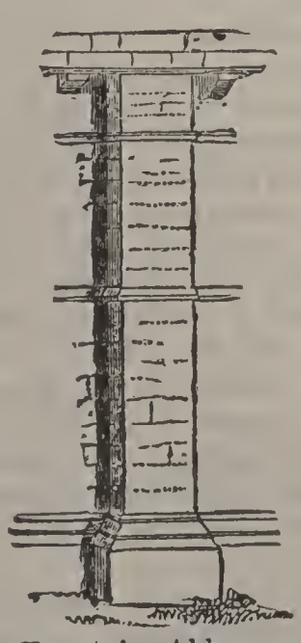
w. coast of the bay at lat. 62°, and called the place Carey's Swan's Nest. Passing southward, he named the Nelson river, and wintered there. The next summer he went to lat. 65°, naming other places, and acquired the conviction that a northwest passage was possible. Returning to England in the fall of 1613 he was knighted, but published no account of his voyage. Purchas gives an extract from his journal.

BUT'TONWOOD: see PLANE.

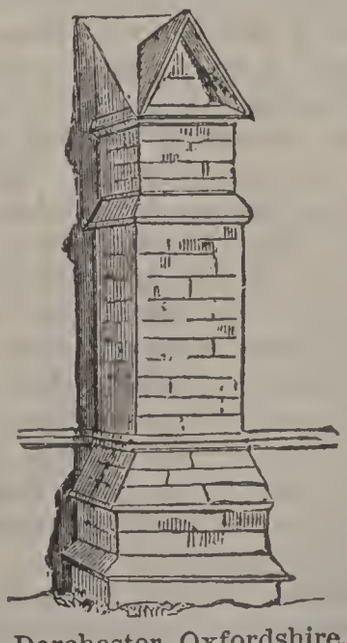
BUTTRESS, n. *bŭt'trĕs* [F. *bouter*, to thrust, to push; *boutant*, a buttress or shore-post: alleged to be a mere modification of OF. *bretesche;* mid. L. *brestach'ĭă*, in senses connected with various parts of fortifications (see BUTT 1)]: an arch or prop which pushes back a wall; a prop or support for a wall; any prop or support; constructed of masonry: V. to support; to prop. BUT'TRESSING, imp. propping; supporting; strengthening. BUT'TRESSED, pp. *-trĕst.* FLYING BUTTRESS, an arched open buttress supporting an upper or inner wall by resting on a lower and outer, or on the ground.

BUT'TRESS: projection adding support or strength to a wall. In the classical style, there were no buttresses, their place being, to a certain extent, supplied by pilasters, antæ, etc. The different stages of Gothic architecture are marked by the form of buttresses employed, almost as distinctly as by the form of the arch. The Norman B. was broad, often semicircular, sometimes dieing into the wall at the top, and never projecting from it to any great extent. Early English buttresses project much more boldly, and are considerably narrower, than the Norman. They are frequently broken into stages, which diminish in size as they ascend. In the decorated style, this division into stages is almost invariable, the B. being often supplied with niches termianting in pinnacles, and very highly ornamented with carving.

VARIOUS FORMS OF BUTTRESSES.

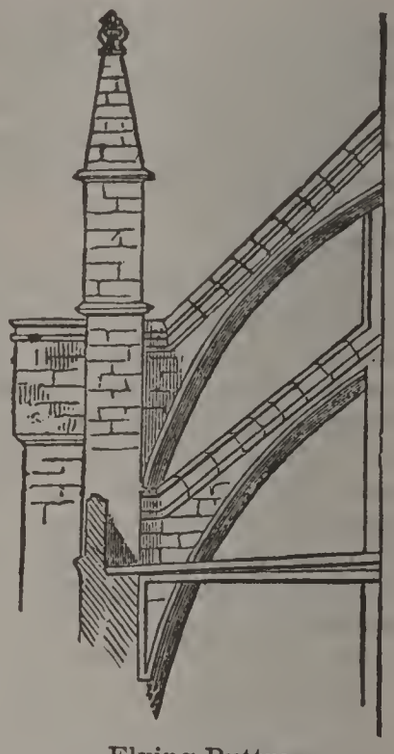


Fountains Abbey, c. 1170.



Dorchester, Oxfordshire, c. 1300.

Canterbury Cathedral.



Flying Buttress,
Westminster Abbey.

statues, etc. In the perpendicular style, they retain the forms introduced during the decorated period, the ornamentation, of course, being varied to suit the character of the style. Flying buttresses—i.e., buttresses in the form of a sloping arch, connecting the upper and central portions of an arched structure with the vertical buttresses of the outer walls—were introduced into England at the period of the Early English, though they were used on the continent previously. They were common in Scotland. In England they are generally called arch-buttresses.

BUTTRICE: see BUTTERIS.

BU'TUA ROOT: see CISSAMPELOS.

BUTYL, n. *bū'tĭl* [Gr. *bou'turon*, butter; *hūlē*, substance of which a thing is made]: in *chem.*, a hydrocarbon radical contained in several organic substances. BUTYLIC, a. *bū-tĭl'ĭk*, of or pertaining to. BUTYLENE, n. *bū'tĭ-lēn*, a gaseous hydrocarbon contained in small quantities in common coal-gas. BUTYLAC'TIC ACID, an organic acid of the lactic acid series. *Note.*—It is common to pronounce, in scientific terms, *-ene* as *ān*, and *-ine* as *ēn;* it is better, however, to pronounce *-ine* as *īn*, *ene* as *ēn*, and *in* as *ĭn*.

BUTYRACEOUS, a. *bū'tĭ-rā'shŭs* [L. *but'yrum*, butter (see BUTTER)]: having the properties of or containing butter. BUTYR'IC, a. *-tĭr'ĭk*, pertaining to or derived from butter—applied to an acid found in butter. BUTYRINE, n. *bū'tĭ-rĭn*, one of the fats present in butter to which it owes its peculiar qualities.

BUTYRIC ACID, *bū-tĭr'ik ăs'ĭd:* acid found in butter; best obtained by saponifying butter with potash, then adding dilute sulphuric acid till an acid reaction is attained, and

distilling about one-half of the mixture, adding a little water, and continuing the distillation till the residue is not acid. B. A. may be obtained also by allowing a small quantity of milk-curd to act upon a solution of sugar at a temperature of 77° to 86°, which excites a peculiar process of fermentation resulting in the formation of butyric acid. Some chalk is added to take up the B. A. whenever produced, and the best proportions are 100 sugar, 8 to 10 fresh curd, and 50 chalk, with sufficient water to make a thin liquid. The butyrate of lime is left in the vessel, and on acting upon that by dilute hydrochloric or sulphuric acid, and redistilling, the free B. A. passes over in vapor, and is condensed. B. A. is a transparent, thin, oily liquid, with a most persistent rancid odor. It is mixable in all proportions in water, alcohol, ether, and oil of vitriol; has the specific gravity 973 (water being 1,000), boils at 314°; though it volatilizes at ordinary temperatures, as appears from the rancid odor of its vapor. Its chemical symbol is $C_3H_7Co.oH$, and it combines with bases, such as lime, soda, etc., to form salts.

BUTYRIC ETHER, *bū-tĭr'ĭk ē'ther*, or PINE-APPLE OIL: an exceedingly fragrant oil obtained by distilling butyric acid (or the butyrate of lime), alcohol, and sulphuric acid. The material which passes over is the B. E., and it is generally mixed with alcohol, and sold in commerce as *Artificial Pine-apple Oil.* It has the same pleasant flavor which belongs to pine-apples, and there is little doubt that pine-apples owe their flavor to the presence of natural B. E. The artificial variety is now extensively used for flavoring confections, as pine-apple drops; for sophisticating bad rum; and for flavoring custards, ices, creams, and an acidulated drink named Pine-apple Ale. B. E. alone is not used as perfumery, as, when inhaled, in even small quantity, it tends to irritate the air-tubes of the lungs and cause headache, but it is one of the materials in compound perfumes. It is composed of ordinary ether (C_4H_5O) and butyric acid ($C_8H_7O_3 + HO$), and its strict chemical name and symbol is the butyrate of the oxide of ethyl ($C_4H_5O,C_8H_7O_3$). It is remarkable that a substance possessing such a disagreeable odor as butyric acid (that of rancid butter) should be one of the components of a substance with such a pleasant flavor as artificial pine-apple oil.

BUXAR, or BAXÁR, *bŭx-âr':* town of Shahabad, in Bahar, presidency of Bengal, on the right bank of the Ganges; notable as the scene of a victory, 1764 by Sir Hector Munro. At the head of 7,072 men, only 857 being Europeans, he defeated a native army of 40,000, and captured 133 guns. B. is 62 m. n.e. of Benares. B. is a place of great sanctity among the Hindus. Pop. 16,498.

BUXBAU'MIA: genus of mosses, of which only one species is known, *B. aphylla*, remarkable for its apparent want of leaves; the whole plant above ground seeming to consist of a little conical bulb, with minute scales, which are really its leaves.

BUXEOUS, a. *bŭks'ē-ŭs* [L. *buxus*, the box-tree]: pertaining to the box-tree.

BUXOM, a. *bŭks'ŭm* [AS. *bocsam*, obedient—from *bûgan*, to bow, to give way: Ger. *biegsam*, flexible—from *biegen*, to bend: OE. *bowsom*, obedient—from *bow*, to bend]: in *OE.*, well inclined to or favorable; obsequious; yielding; gay; lively; brisk and healthy, with a dash of good-humor—applied to a woman. BUX'OMLY, ad. *-lĭ*. BUX'OMNESS, n. the quality of being brisk, healthy, and good-humored.

BUXTON, *bûx'ton:* town in Derbyshire, 33 m. n.w. of Derby; 900 ft. above the sea, in a deep valley, surrounded by hills and moors, which have been tastefully planted; the only approach being by a narrow ravine, by which the Wye flows into the Derwent. The new part of the town is much under the level of the old. Five miles e. of B. is Chee Tor, a perpendicular limestone rock, rising 300–400 ft. from the Wye. B. has for 300 years been famous for its calcareous springs, tepid (82° F.), and cold (discharging 120 gallons of water per minute), and its chalybeate springs. It is visited annually, from June to Oct., by 12,000–14,000 persons, the waters being taken for indigestion, gout, rheumatism, and nervous and cutaneous diseases. Nearly 5,000 strangers can be accommodated. There is an institution, called the Devonshire Hospital, containing 100 beds, supported by subscription, where nearly 1,000 patients are annually boarded and lodged free of charge. The baths and public walks are numerous. Much of the splendor of B. is due to the dukes of Devonshire, one of whom, in the last century, at the cost of £120,000, erected an immense three-storied pile of buildings, of gritstone called the Crescent, a curve of 200 ft., with wings of 58 ft. It includes several hotels, a library, assembly rooms, etc. Near B. is the Diamond Hill, famous for its crystals; and Poole's Hole, a stalactitic cavern 560 yards long. The Romans had baths here. Mary Queen of Scots resided for some time at B., when in the custody of the Earl of Shrewsbury. B. is approached by railway both from n. and s.; and the baths, rebuilt some years ago, are considered among the finest in Europe. Four newspapers are published. Pop. (1871) 3,717; (1881) 6,021; (1891) 7,424.

BUXTON, *bŭks'tn*, JEDIDIAH: 1705—abt. 1775; b. Elmton, Derbyshire. A phenomenal calculator, he was practically inbecile in other respects, and, though grandson of the vicar and son of the parish schoolmaster, never learned to write. All his powers went to mental arithmetic, in which he was a prodigy; of a sermon he noted merely the number of words in it, and when taken to the theatre was absorbed in counting those uttered by Garrick, and the steps made by the dancers. In 1754 he walked to London and was presented to the Royal Soc.; the members asked him how many cubical eighths of an inch there are in an object whose sides measure 23,145,789, 5,642,732, and 54,965 yards, and he presently gave a correct answer. The dimensions of any body being given, he could thus estimate the hair's breadths (or forty-eighths of an inch) contained, and was seldom mistaken. While walking over the lordship of Elmton, 1,000 acres, he mentally and accurately measured

it in sq. inches. He could give no satisfactory account of his system of calculation, if indeed he had any.

BUXTON, Sir Thomas Fowell: 1786–1845, Feb. 19; b. Earl's Colne, Essex, England: philanthropist of singular earnestness and force. The eldest son of a wealthy family, and early deprived of paternal guidance, his youth was notable chiefly for a strong development of animal energy, natural to a young Englishman whose stature exceeded 6 ft. 4 inches. At the Univ. of Dublin, his mind at length developed under the necessity of efforts to raise the family fortunes; and though his preparatory education had been almost thrown away, at the age of 21 he left the univ. its most distinguished graduate. In that year he married a sister of the celebrated Mrs. Fry, and entered business as a brewer, with an energy which brought splendid prosperity. His warm religious and moral impulses soon brought him prominently forward as an advocate of philanthropic interests. Prison discipline formed one of the earliest subjects of his efforts. In 1818, he entered parliament as member for Weymouth, which he continued to represent for about 20 years, prominent in every debate on such questions as the amelioration of criminal law and of prison discipline, widow-burning in India, and slave emancipation. The latter, in particular, engrossed a large share of his activity for many years, and no man on that side showed more indomitable zeal and firmness in its advocacy. In 1837, he was rejected by his constituency, and refused ever after to stand for a borough. His philanthropic labors ended only with his life. In 1840, he received a baronetcy. See *Memoirs of Sir T. Fowell B.* (1848).

BUXTORF, *bûks'torf*, Johann; 1564, Dec. 25—1629, Sep. 13; b. Kamen, Westphalia: orientalist. He studied at Marburg, Herborn, Basel, and Geneva. After travelling through Germany and Switzerland, he settled at Basel, where he became prof. of Hebrew 1591. He died of the plague. In knowledge of rabbinical literature, he surpassed all his contemporaries. The two works which prove his extensive acquaintance with this recondite branch of theologieal study, are his *Biblia Hebraica Rabbinica* (Basel, 1618–19), and his *Tiberias seu Commentarius Masorethicus* (Basel, 1620). The most useful of his grammatical works is the *Lexicon Hebraicum et Chaldaicum* (Basel, 1607).

BUXTORF, Johann: orientalist: 1599, Aug. 13—1664, Aug. 16; b. Basel; son of Johann B. At five years of age —according to his rather credulous biographers—he could read German, Latin, and Hebrew. To perfect his knowledge of these tongues, he visited Holland, France, and Germany; and in 1630 was appointed to succeed his father in the chair of Hebrew at Basel, where he died. Besides his *Lexicon Chaldaicum et Syriacum* (Basel, 1622), and a work of Maimonides, entitled *More Nevochim* (Basel, 1629), an exposition of obscure passages of the Old Testament, he published from the MSS. of his father a *Lexicon Chal-*

daicum, Talmudicum, et Rabbinicum (Basel, 1639), and *Concordantiæ Bibliorum Hebraicorum* (Basel, 1632).

BUXUS: see Box.

BUY, v. *bī* [AS. *bycgan;* Goth. *bugjan*, to buy, to purchase: comp. Gael. *buidhinn*, to gain]: to obtain a right to anything by giving money or value for it; to purchase; to bribe or corrupt. BUY'ING, imp. BOUGHT, pt. pp. *bawt*, purchased. BUY'ER, n. *bī'ēr*, one who buys. TO BUY OFF or OUT, to get quit of a person's claim or opposition by an equivalent or money. TO BUY UP, to purchase extensively particular goods, generally with the view of ruling the market for them. BUY AND SELL, and BOUGHT AND SOLD, in the sense of dealing treacherously with, or betrayal.

BUYUKDEREH, *bô-yôk-dā'rā:* beautiful suburb of Constantinople, from which it is a few miles distant; on the Bosporus, in the midst of the most charming scenery. It forms the summer residence of many of the Christian ambassadors, some of whom have splendid mansions here.

BUZZ, v. *bŭz* [an imitative word: It. *buzzicare*, to whisper, to buzz]: to make a noise like bees; to whisper; to make a hissing or murmuring noise; to spread secretly, as to *buzz* about: N. a hum; a noise like bees and insects; a hissing or murmuring noise caused by the whispering of great numbers. BUZ'ZING, imp.: N. the humming sounds of bees; whispering in secret. BUZZED, pp. *bŭzd*. BUZ'ZINGLY, ad. *-lĭ*.

BUZZARD, n. *bŭz'zĕrd* [F. *busard:* It. *bozzago*]: a species of hawk; *Buteo vulgaris*, the American species, *Buteo borealis*, called also hen-hawk; a blockhead or dunce: ADJ. senseless; stupid. BUZZARDET, n. *bŭz'zĕr-dĕt*, a species of hawk much like the buzzard.

BUZZARD, *bŭz'zĕrd* (*Buteo*): genus of *Accipitres* (q.v.), or birds of prey, of the family *Falconidæ*, having a rather small and weak bill, which bends from the base, and is not notched, as in falcons. The legs are short and strong, the tarsi covered with scales or with feathers, the toes short, and the claws strong. Buzzards may be regarded as an inferior kind of eagles; they have not the courage of eagles and falcons, nor equal strength of bill or claws. They are large birds; the COMMON BUZZARD (*B. vulgaris*) measuring almost 4 ft. from tip to tip of its outstretched wings. It is subject to variations of plumage; the prevailing color is brown, with a considerable mixture of black on the upper parts, and of white or grayish-white on the under. It is sluggish and inactive, in comparison with many other birds of the same family; is usually slow in its flight, and often sits long on a tree, watching for prey, which, when it perceives, it glides silently into the air, and sweeping rapidly down, seizes it in its claws. This Buzzard, less common in Britain than formerly, is plentiful in Europe; it is found in the

n. of Africa, and is known to exist in the w. of Asia; but it is doubtful how far it extends over that continent, a distinct though very similar species occurring in the Himalaya mountains. The Common B. is, however, a N. American bird. Tame female buzzards have been known in several instances to exhibit so strong a propensity for incubation, and the rearing of young, at the proper season, that they have hatched hens' eggs and brought up the chickens, although if chickens not of their own hatching were brought within their reach, they devoured them. Meat given to the B. nurse was carefully divided among her nurslings, but the chickens found out by their own

Common Buzzard (*Buteo vulgaris*).

instincts the use of grain and other vegetable food.—The Rough-legged B. (*B. lagopus*) is very similar to the Common B., but is distinguished by having the tarsi feathered to the toes, while in the Common B. they are covered with scales. It is a rarer British bird, yet not infrequent; it is very widely diffused, being found in the old world from Lapland to the Cape of Good Hope, and equally common in N. America. It is most often seen in marshy districts, skimming over marshes, where it makes prey of frogs.—The Red-tailed Hawk of N. America is a species of B. (*Buteo borealis*), in very bad repute among farmers and housewives for its frequent invasion of poultry-yards, from which it has acquired the name of *Hen-hawk*.—Several other species of B. appear limited to particular parts of the world, as *Buteo Jackal*—so called from the resemblance of its voice to that of the jackal—to s. Africa; and *B. melanosternon* to Australia. The Australian species has the head, chest, and centre of the belly deep black.—The Honey Buzzards (q.v.) belong to a different genus,

although nearly allied to the true buzzards, as are also the HARRIERS (q.v.), of which the most common British species, the Marsh Harrier, is sometimes called the *Moor Buzzard.*—BALD B. is a name of the OSPREY (q.v.).

BUZZARD'S BAY: on the s. coast of Mass., length 30 m., average width 7 m. It contains the harbor of New Bedford and several others; the Elizabeth Islands separate it from the ocean and Vineyard Sound. Its head is but 4 m. from Cape Cod Bay, and a canal cut across this space would shorten the course of many vessels, and insulate the entire peninsula. Such a canal has been talked of for 150 years, but the lack of a good harbor at the n. end presents a difficulty.

BY, prep. *bī* [AS. *bi:* Ger. *bei:* Dut. *bij:* Sks. *abhi*]: near; close; at hand; at the side; beside; indicating 'instrument,' 'manner,' 'cause,' 'nearness,' or 'difference,' etc.: AD. near. BY, sometimes BYE, as a prefix, means concealed; quiet; out of the direct way; private, etc. BY-BIDDING, bidding at an auction, not to purchase, but to enhance the price, by one who is employed by the owner. It is unlawful except for preventing the sale of property evidently below its actual value. BY-CORNER, n. a private place. BY-LANE, n. a private lane. BY-NAME, n. nickname. BY-PAST, a. past; gone by. BY-PATH, n. or BY-ROAD, n. a quiet or private road. BY-PLAY, n. a side scene carried on, sometimes in dumb-show, while the main action is proceeding. BY'STANDER, n. one who stands near; a spectator. BY-STREET, n. a street off the main street. BY-STROKE, n. a sly or secret stroke. BY-WALK, or BY-WAY, n. a private walk. BY-WORD, n. a common saying; a proverb. BYGONE, n. a past incident or event. LET BY-GONES BE BY-GONES, let the past be forgotten. TO STAND BY, to stand aside; to aid; to assist. STAND BY, prepare to lend a hand. TO PASS BY, to pass at the side of. BY-AND-BY, or BY-AND-BYE, ad. soon; shortly. BY-THE-BYE, ad. by the way; introductory to some things not in the direct course of conversation. BYE! BYE! *bī*, a familiar reduplication of *good-bye.* GOOD-BYE, farewell; suggested as a probable abbrevation of 'good-*be*-with-*ye*' or 'God *be*-with-*ye.*' *Note.*—The origin of BY or BYE in such phrases as *good-bye. by-the-bye,* may be explained by the Gael. *bàigh,* kindness, and the probable reduplication, *bàigh!-bàigh!* bye-bye.

BYBLOS, *bĭb'lus:* ancient city of Phœnicia, now called Jubeïl, at the base of the lower range of the Libanus, about halfway between Tripoli and Beyrout. B. was famous in mythology as the birthplace of Adonis, or Thammuz, in whose honor a splendid temple was erected, which attracted many worshippers. The name given to the town by the Jews was Giblah, and the Giblites are noticed in the Scriptures as stone-squarers and calkers of ships. A wall belonging, apparently, to the era of the Crusades, surrounds the town, and the remains of a Roman theatre are still visible.

BYBLOS: town in the Egyptian Delta, celebrated for its manufacture of papyrus from the byblus or papyrus plant.

BYE, n. *bī*, BYES, plu. *bīz* [*by* in the sense of 'aside' or

'to the side': comp. AS. *by* or *bye*, a dwelling; *byan*, to inhabit]: in *cricket*, a play or shot in which the batsman fails to strike the ball, and the wicket-keeper behind him does not catch it.

BY-LAW, n. [Sw. *bylag*, a town law—from *by*, a borough; *lag*, order, law: Icel. *baejar-lög*, a town law—from *baer*, a town; *lög*, law (see BYRLAW)]: a private or specific regulation, of which a set are usually made by corporate bodies for the control and government of the corporation. By-laws mostly concern matters less organic and fundamental than those set forth in a constitution or a charter. They are binding, unless contrary to the laws of the land, or to the charter, or act of incorporation, or, as has been decided in England, unless manifestly unreasonable. Blackstone states that the right of making by-laws was allowed by the law of the Twelve Tables at Rome; and Mr. Stephen, in his *Commentaries*, states that in the law of England such a right is so much of course, as regards every corporation, that if the charter by which certain persons are incorporated give to a select body, out of their whole number, a power to make B. as to certain specified matters, the body at large is nevertheless at liberty to make them with regard to all matters not specified. Every corporation, too, can of course alter or repeal the B. which itself has made.

BYLES, *bīlz*, MATHER, D.D.: 1707, Mar. 26—1788, July, 5; b. Boston: descendant of Richard Mather and John Cotton. He graduated at Harvard Coll. 1725, and was ordained pastor of the Hollis St. Church, Boston, 1733, but had to resign in 1776 because of his loyalty to the crown. This attitude caused him, as he said, to be 'guarded, reguarded, and disregarded,' a sentence of banishment having been commuted. He published sundry fugitive sermons and poems, corresponded in his earlier days with Pope, Swift, and Watts, and had much reputation as a wit, i.e., a punster. A son of the same name and title, 1735–1814, was rector of Christ Church, Boston, and afterward at St. Johns, N. B.

BYNG, *bĭng*, GEORGE (Viscount TORRINGTON): British admiral: 1663, Jan. 27—1733, Jan. 17; eldest son of John B., of Wrotham, Kent.; entered the navy as a volunteer at the age of 15, and rapidly rose to the rank of lieut. In 1688, his activity and zeal in attaching the officers of the fleet to the cause of the Revolution, commended him to the Prince of Orange, and he was advanced to the rank of captain. In 1702 he took part in the capturing and burning of the Spanish fleet at Vigo, and in the following year was made rear-admiral of the red. The attack on Gibraltar was confided to his sole command, and for his gallant conduct at the battle of Malaga he was knighted by Queen Anne. In 1708 he became admiral of the blue, and commanded a squadron fitted out to oppose an intended invasion of Scotland from France in the interest of the Pretender. He pursued the French fleet to the Firth of Forth, took one ship, and forced the fleet back to Dunkirk; for which service he was presented with the freedom of the city of Edinburgh. On the breaking out of the rebellion of 1715, he was ap-

pointed to command a squadron in the Downs, and for important services against the French, was created a baronet. In 1718, he commanded the English fleet sent to Sicily for the protection of the neutrality of Italy, and gained a victory over the Spanish fleet off Messina. Soon afterward he was appointed treasurer of the navy and rear-admiral of Great Britain. In 1721, Jan., he was sworn one of the privy council, and in Sep. created Baron Southhill and Viscount Torrington. On the revival of the Order of the Bath, 1725, he was installed one of the knights; and, on the accession of George II., was nominated first lord of the admiralty. He represented Plymouth in parliament 1706–21.

BYNG, John: brave but ill-fated British admiral: 1704–1757, Mar. 14; fourth son of George B. (Viscount Torrington). He entered the navy early, served under his father, and, 1727, became captain. In 1748, he had attained the rank of admiral of the red. In 1756, he was appointed to command a squadron of 10 ships of the line in the Mediterranean, intended for the relief of Minorca, blockaded by a French fleet under La Galissoniere. On May 20 B. made the signal to engage, which was obeyed by Rear-Admiral West with such impetuosity that several of the enemy's ships were driven out of the line; but B. not advancing to his support, the French were allowed to escape, and Minorca was lost. The dissatisfaction in England, on the news arriving, was taken advantage of by the ministry to avert the public odium from their own inefficient measures. B. was tried by a court-martial, and condemned to death, for a breach of the 12th article of war, but recommended to mercy. Sacrificed to the general indignation, he was shot on board the *Monarch*, at Portsmouth, meeting his fate with firmness and resignation. In the fleet, he was not popular, being a strict disciplinarian.

BYNKERSHOEK, *bīn'-kĕrs-hûk*, Cornelius van: 1675, May 29—1743, Apr. 16; b. Middelburg, Zealand: Dutch jurisconsult. He studied at the Univ. of Franeker, took the degree of doctor, 1694, and immediately began practice as an advocate at the Hague. In 1703, he was elected by the states-general a member of the supreme court, and in the exercise of his functions, soon had occasion to observe how defective and vague was the common law of the country. In 1710, with a view to remedy this, he published the first part of his *Observationes Juris Romani;* in 1719, his *Opuscula Varii Argumenti;* and in 1724 he was elevated to the dignity of pres. of the supreme court. In 1733, appeared the rest of his *Observationes Juris Romani*. B. now engaged earnestly in the study of Dutch and international law, acquiring, of the Dutch law in particular, an extensive and solid knowledge. His great work on this subject is *Quæstiones Juris Privati*, which he did not live to finish: and on international law, *Quæstiones Juris Publici*. In addition, B. collected (from his notes) the decisions and proceedings of the supreme court in his time, under the title *Observationes Tumultuariæ*, and besides made a digest under the title of *Corpus Juris Hollandici et Zelandici*, of all the laws of his

own country, whether statutory, or existing in the decisions of courts, or in the practice of the bar, or in the customs of particular places—perhaps his most valuable work. A complete edition of his works was published by Prof. Vicat, of Geneva, 1761.

BYRD, *bĕrd*, WILLIAM, F.R.S.: 1674, Mar. 28—1744, Aug. 26; b. Westover, Va. He inherited a large estate, studied in England and the Netherlands, was called to the bar in London, and visited the French court. Returning to Va., he was long receiver-gen. of the revenue, thrice colonial agent in England, 37 years a member of council, and at last its president. He was a commissioner to settle the N. C. boundary in 1728, and in 1733 laid out on his own lands the cities of Richmond and Petersburg. He had the largest private library in America, and was one of its foremost men in that day, alike in mental culture and in public services. His *Westover MSS.*, pub. Petersburg 1841, contribute much to our knowledge of Virginia in his time.

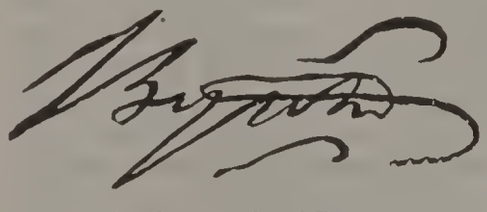
BYRE, n. *bīr* [OF. *bouverie*, a stall for oxen—from F. *boeuf;* L. *bos*, an ox: Gael. *buar*, cattle; *buarth*, a cattle yard]: in *Scot.*, a house for cows; a shelter for cattle.

BYRGIUS, *bĕr'jĭ-us*, JUSTUS (properly, JOBST BÜRGI): 1552, Feb. 28—1633; b. Lichtensteig, canton of St. Gall, Switzerland: inventor of astronomical instruments. In 1759, he went into the service of the learned Landgraf of Hesse, Wilhelm IV. His first work was a celestial globe, the surface of which was plated with silver, and in which the stars were placed according to his own observations. The landgraf sent it to the Emperor Rudolf II., who thought it so beautiful that in 1604 he appointed B. his own mechanician. B. subsequently went to Austria, but returned to Cassel, 1622, where he died. Many of his reputed discoveries and inventions are questioned, such as those of logarithms and the proportional compasses; but he seems to have hit upon something like both, while it is certain that he was the inventor of a method of resolving spherical triangles.

BYRLAW, or BIRLAW, or BURLAW, *bĕr'law:* a sort of popular jurisprudence formerly in use in Scotland, in villages and among husbandmen. The word is derived from *burgh*. Sir John Skene, writing 1597, when the system was in full force, defines B. as '*leges rusticorum, de re rustica latæ*—laws made by husbandmen, concerning neighborhood to be kept among themselves.'—*Reg. Majest.* lib. iv. As the B. was enacted by common consent of the villagers or neighbors, so it was administered by judges chosen by them from their own ranks. These judges were commonly called 'byrlaw men,' a name still applied in some parts of Scotland to an arbiter, oddsman, or umpire. The courts which they held were called 'byrlaw courts,' and took cognizance of disputes between neighbor and neighbor. B. seems an interesting survival of the system of the ancient Aryan village community.

BYRON, *bī'run*, ANNE ISABELLA MILBANKE: 1792, May 17—1860, May 16; dau. of Sir Ralph Milbanke. She was married to Lord Byron 1815, Jan. 2; the union was not happy, and she left him 13 months later. She inherited the large estates of her uncle and mother, and in 1856 the title of Baroness Wentworth. She gave largely to industrial schools, reformatory institutions, and other benevolent enterprises.

BYRON, *bī'run*, GEORGE GORDON, Lord: poet: 1788, Jan. 22—1824, Apr. 29; b. in Holles street London; only son of Capt. John B., of the Guards, and Catherine Gordon of Gight, an heiress in Aberdeenshire. Captain B. and his wife did not live happily. Domestic peace perished in the conflict of their ungovernable tempers. The husband's habits were profligate in the extreme, and the wife's fortune was soon squandered in the debauch and at the gambling-table. Separated from her husband, the lady retired to the city of Aberdeen with her little lame boy, George, whom she passionately loved, her sole income at this time being about £130 per annum. In his 11th year, B. succeeded his grand-uncle, William, Lord B.; and mother and son immediately left the north for Newstead Abbey, the ancient seat of the family, a few miles from Nottingham, in the romantic district which Sherwood Forest shadowed, once familiar with the bugle of Robin Hood. On succeeding to the title, B. was placed in a private school at Dulwich, and thereafter sent to Harrow. The most remarkable thing about B.'s early years was his extraordinary attachments. Like almost every member of the poetic tribe, he 'had a passion for the name of Mary.' In his 8th year, in Aberdeenshire, he fell in love with Mary Duff. Margaret Parker, his cousin, who died early, was his next idol. His strongest passion was, however, for Mary Chaworth. This lady he first met on her visit to Newstead, 1803, at which date he was in his 16th year. Miss Chaworth's father had been killed in a duel by Lord B., grand-uncle of the poet, and marriage would have healed the family feud, and would have joined rich estates. But it was not to be. Miss Chaworth was B.'s senior by two years, and evidently felt little flattered by the worship of the lame Harrow boy. Next year came the parting interview described in *The Dream*. In 1805, B. removed to Trinity College, Cambridge, and two years thereafter his first volume of verse, entitled *Hours of Idleness*, was printed at Newark. The poems were not without merit, but they might have been written by any well-educated lad, who, in addition to ordinary ability, possessed a slight touch of poetic sensibility. The volume was fiercely assailed by Lord (then Mr.) Brougham in the *Edinburgh Review*, and his sarcasms stung B. into a poet. The satire, *English Bards and Scotch Reviewers*, was written in reply to the article in the *Edinburgh*, and the



Authograph of Byron.

town was taken by a play of wit and a mastery of versification unequalled since the days of Pope. In the babble of praise that immediately arose, B. withdrew from England, visited the shores of the Mediterranean, and sojourned in Turkey and Greece. After his return, he published the first two cantos of *Childe Harold*, in 1812, with immense success, and was at once enrolled among the great poets of his country. During the next two years, he produced *The Giaour*, *The Bride of Abydos*, *The Corsair*, and *Lara*. While these brilliant pieces were flowing from his pen, he was indulging in all the revelries and excesses of the metropolis. What was noblest in the man revolted at this mode of life, and, in an effort to escape from it, he married Miss Milbanke, daughter of Sir Ralph Milbanke, a baronet in the county of Durham (see BYRON, ANNE ISABELLA MILBANKE). This union proved singularly infelicitous. It lasted only a year, and during that brief period, money embarrassments, recriminations, and all the miseries incident to an ill-assorted marriage, were frequent. After the birth of her child, Ada, Lady B. retired to her father's house, and refused to return. This event, from the celebrity of one of the parties, caused considerable excitement in the fashionable world. B. became the subject of all uncharitable tongues. The most popular poet was for a time the most unpopular individual in the country. In one of his letters, written from Italy some years later, referring to the slanders current at the time, he thus expresses himself: 'I was accused of every monstrous vice by public rumour and private rancor. My name, which had been a knightly or a noble one since my fathers helped to conquer the kingdom for William the Norman, was tainted. I felt that if what was whispered, and muttered, and murmured was true, I was unfit for England; if false, England was unfit for me. I withdrew.' The separation from his wife, and the departure from England, mark a stage in B.'s genius. A new element of power had entered into his verse; the reader feels it quite distinctly in the magnificent burst of exultation that opens the third canto of the *Childe*—

> Once more upon the waters, yet once more!

Misery and indignation stimulated him to remarkable activity. Four months' stay at Geneva produced the third canto of *Childe Harold* and *The Prisoner of Chillon*. *Manfred* and *The Lament of Tasso* were written 1817. The next year, he was at Venice, and finished *Childe Harold* there; and, in the gay and witty *Beppo*, made an experiment in the new field which he was afterward to work so successfully. During the next three years, he produced the first five cantos of *Don Juan*, and a number of dramas of various merit, *Cain* and *Werner* being at opposite poles. In 1822, he removed to Pisa, and worked there at *Don Juan*, which poem, with *The Vision of Judgment*, occupied his pen almost to the close of his life. Morally, his Italian life was reprehensible, and his genius was tainted by his indulgences. At the close of his career, he was visited by a new inspiration; the sun, so long obscured,

shone out gloriously at its setting. In the summer of 1823, he sailed for Greece, to aid the struggle for independence with his influence and money. He arrived at Missolonghi, 1824, Jan. 4. There he found nothing but confusion and contending chiefs; but in three months he succeeded in evoking a kind of order from the turbulent patriotic chaos. His health, however, began to fail. On Apr. 9 he was overtaken by a shower while on horseback, and fever and rheumatism followed. Medical aid was procured, and copious bleeding was recommended; but this B., with characteristic wilfulness, opposed. After twenty-four hours' insensibility, he died at evening. His body was conveyed to England; and, denied a resting-place in Westminster Abbey, it rests in the family vault in the village church of Hucknall, near Newstead. A monument to B. was uncovered at Missolonghi 1881, amid demonstrations of gratitude to his memory.

Lord B. is a remarkable instance of the fluctuations of literary fashion. Elevated to the highest pinnacle of fame in the heyday of his early popularity, he was unduly disregarded after his death, when the false romance which he threw around himself and his writings began to wear away; and it is only during the last 20 or 30 years that the proper place has been found for him in the public estimation. He is high, but not the highest. The resources of his intellect were amazing. He gained his first reputation as a depicter of the gloomy and stormful passions. After he wrote *Beppo*, he was surprised to find that he was a humorist; when he reached Greece he discovered an ability for military organization. When the schoolgirls of England fancied their handsome idol with a scowling brow and a curled lip, he was laughing in Italy, and declaring himself the most unromantic being in the world. And he was right. Take away all his oriental wrappings, and you discover a sincere Englishman, who, above all things, hates cant and humbug. In *Don Juan* and his *Letters* there is a wonderful fund of wit, sarcasm, humor, and knowledge of man. Few men had a clearer eye for fact and reality. His eloquence, pathos, and despair; his *Manfreds* and *Childe Harolds*, were only phases of his mind. Toward the close of his life he was working toward his real strength, which lay in wit and the direct representation of human life. If his years had been extended he would probably have deserted poetry for prose, gaudy, colored fiction for sober fact; and the assertion may be hazarded that the English novel would have boasted of another and a greater Fielding. See the *Life, Letters, and Journal* of B., by Thomas Moore (1830); Leigh Hunt's *Lord B.* (1828); the Countess Guiccioli's *Recollections of Lord B.* (1869); and Prof. Nichol's short work on *Byron* (1880).

BYRON, Henry James: b. 1835 at Manchester; dramatist. He was educated in London and called to the bar, but turned early to literature, edited *Fun*, and published a novel *Paid in Full*. In 1858 his burlesque. *Fra Diavolo*, was produced at the Strand; it has been followed by many

travesties, farces, and comedies. In 1869, Oct., he began to act at the Globe Theatre, London, in a play of his own. He d. after a short but successful career 1884, Apr. 11.

BYRON, JOHN, F.R.S.: 1691–1763, Sep. 23; b. at Kersall, near Manchester: poet. He studied at Trinity Coll., Cambridge; was a fellow of it 1714–16, and contributed to the *Spectator* the famous pastoral, *Colin and Phebe.* Cut off from his relatives by marriage with a cousin, and reduced to straits, he invented and taught a system of shorthand, which brought him support, reputation, and the jocosely affectionate title of Grand Master. Afterward inheriting the family estate, he spent his later years at Kersall. He had no care for fame, published little, and wrote merely to amuse himself and friends; but his *Poems,* posthumously gathered in 2 vols. 1773, reprinted 1814, show a powerful mind and views more familiar to our time than to his own; among them are several of our finest epigrams, and a Christmas hymn now in almost universal use. His originality and wit equalled his piety; though a disciple of Jacob Behmen, his theology was eminently rational. The word *bibliolatry* appears to be of his coining. His *Literary Remains* were published by the Cheatham Society, 1857. John Wesley called him 'an uncommon genius, a man of the finest and strongest understanding.'

BYRON, The Hon. JOHN: 1723, Nov. 8—1786, Apr. 10; b. Newstead Abbey; second son of the fourth Lord Byron, and grandfather of the poet. He entered the navy in childhood, was a midshipman in Lord Anson's squadron, suffered shipwreck on an island off the coast of Patagonia, and remained there five years, as described in his *Narrative,* 1768. Many doleful experiences at sea won him the name of 'Foul-weather Jack.' He served in the war with France, destroyed the fortifications of Louisburg 1760, commanded an expedition to the South Sea 1764–66, circumnavigated the globe, and discovered two islands, one of which was named from him. In 1769, he was made gov. of Newfoundland, and in 1776 vice-admiral. In 1778, he was sent to the West Indies, and fought the French under Count D'Estaing off Granada, 1779, July 6.

BYRON BAY: on the n.e. coast of Labrador; lat 54° 40′ n.; long. 57° 30′ w.

BYRON ISLAND: one of the Gilbert Islands (q.v.) in the Pacific Ocean, near the equator.

BYSSUS, n. *bĭs′sus* [L.—from Gr. *bussos,* fine flax]: in *conch.*, the fine silky filaments by which the mussel and some other bivalves attach themselves to the rocks and sea-bottom; in *bot.*, the silky tufts of mold or fungus-growth springing from damp and decaying substances. BYS′SOLITE, n. *-ō-līt* [Gr. *lithos,* a stone]: a term applied to fine fibrous varieties of amianthus, tremolite, etc. BYS′SINE, a. *-sĭn,* of or like silk. BYSSA′CEOUS, a. *-sā′shŭs,* in *bot.*, composed of delicate filaments resembling cotton or wool. BYS′SOID, a. *-soyd* [Gr. *eidos,* form]: in *bot.*, very slender, like a cobweb. BYSSIFEROUS, a. *bĭs-sĭf′ĕr-ŭs* [L. *fero,* I bear or carry]: producing a byssus.

BYSSUS, *bĭs'sŭs:* bundle of silky filaments by which many lamellibranchiate mollusks—bivalve shells—attach themselves to rocks or other fixed substances. The B. springs from a cavity at the base of the solitary foot of the mollusk, and its filaments, capable of being reproduced if destroyed, are secreted by a glandular tissue which occupies a furrow running nearly to the extremity of the foot. They are united at the base in a common mass, and are often considerably divergent. They are guided to their place by the foot, and expand into a sort of disk at the point of attachment, so as to have a firm hold. A few

Byssus of Common Mussel.

common mussels in an aquarium readily afford an opportunity of observing the B., particularly when the filaments are attached to the glass-sides of the vessel. In the *Pinna* (q.v.) of the Mediterranean, the B. is remarkably long and delicate, has a beautiful silky lustre, is very strong, and is capable of being woven into cloth, upon which a very high value is set; but the animal which produces it is now so rare, that it is almost exclusively an article of curiosity. This manufacture was known to the ancients.

BYSSUS: genus established by Linnæus to include some of the lowest and most obscure forms of vegetation, and defined as having a substance like fine down or velvet, simple or feathered. Botanists sometimes ranked it among *Algæ*, sometimes among *Fungi;* it has been made the type of a group *Byssaceæ*, and placed among Lichens. Some have regarded this group as entitled to the rank of a distinct order, 'comprehending the filamentous fungi found in cellars, and similar plants;' but others reject the genus as altogether spurious. Some of the species once included in it have now been satisfactorily shown to be Lichens, others to be *Confervaceæ*, while many appear to be really not distinct vegetable forms, but cryptogamic plants prevented by unfavorable circumstances from proper development. The green incrustations formerly regarded as species of B., have been found to be the primary germination of mosses, often species of *Polytrichum* and *Tortula*. It cannot be said.

Black-rock Byssus. (*Byssus nigra*).

however, that the nature of all the vegetable forms which have been referred to the genus of B., has yet been ascertained. Some are very phosphorescent, and are found generally where some higher form of vegetation is undergoing decay.

BYSTRÖM, *bü'ström*, JOHANN NIKOLAUS: 1783, Dec. 18—1848, Mar. 13; b. Philippstadt, province of Wermeland, Sweden: sculptor; educated under Sergell of Stockholm. In 1809, he obtained the highest prize in the Swedish Acad. of Arts, and in 1810 went to Rome, where he executed his first independent work, a *Drunken Bacchante*, and sent it home. It was received with great approbation, and Byström had to repeat it thrice. In 1815, he returned to Stockholm, and surprised the newly elected crown prince by exhibiting a colossal statue of himself. The crown-prince was highly gratified and commissioned Byström to execute colossal statues of Charles X., XI., and XII. After 1838 he resided in Stockholm; but returned to Rome, 1844, and died there. His chief works are: *A Nymph Going into the Bath, A Reclining Juno Suckling the Young Hercules, Hygeia, A Pandora Combing her Hair, A Dancing-girl*, a statue of Linnæus, and colossal statues of Charles XIII., Gustavus Adolphus and Charles XIV.

BYTTNERIACEÆ, *bĭt-nē-ri-ā'sē-ē:* nat. ord. of exogenous plants, sometimes united with the ord. *Sterculiaceæ* (q.v.), also closely allied to *Malvaceæ* (q.v.), from which it differs, especially in the stamens not being columnar—though more or less united, generally into a cup or tube—also in the anthers being turned inward, and 2-celled. The species of this order are trees, shrubs, or half-shrubby plants, chiefly in tropical climates, though some are natives of the temperate zones. About 400 have been described. The flowers of many are beautiful. The most important product of the order is COCOA (q.v.). The fruit of *Guazuma ulmifolia*, a native of Brazil, is eaten, being filled with a sweet and pleasant mucilage. The young bark of this tree yields, when macerated, a copious mucilage, and is therefore used in Martinique for clarifying sugar, as is that of *Kydia calycina* in the n. provinces of India. *Guazuma ulmifolia* was introduced into India, and at one time largely cultivated in the Madras presidency, under the name of Bastard Cedar. Its straight, luxuriant young branches yield a strong fibre. The bark of other species of this order also affords a tough fibre used for making cordage, particularly that of *Microlæna* (or *Schillera*) *spectabilis* in the regions on the s. base of the Himalaya, *Abroma augustum* in various parts of India, *Dombeya spectabilis* in Madagascar, and *D. umbellata* in the Isle of Bourbon. *Abroma augustum* has been especially recommended to attention and cultivation on account of its fibre, which is beautiful, white, fine, strong, and produced in abundance.

BYZANTINE ART.

BYZANTINE ART, *bĭz-ăn'tĭn:* art of the period of the emperors of the East at Constantinople. From the time of Constantine the Great, the emperors of the East arrogated to their imperial city the pre-eminence which, ancient Rom. had long possessed; and, as a consequence of this assumption, Constantinople, or Byzantium, as it continued to be called, became the rival of the mother-city in the richness and variety of its artistic monuments. In Rome, indeed in the whole of Western Europe, the first effect of the influx of the mighty stream of barbarian life, and the consequent dissolution of existing society, was the almost total suppression of artistic effort. It was then that the artists of the West, willing and eager to avail themselves of the invitation held out to them, poured into Constantinople, carrying with them what remained of the artistic life of the ancient world. Byzantium was the hearth on which, during the dark period of the middle ages, those feeble sparks of ancient art were kept alive, which served to kindle the new and independent artistic life of the modern world. Not only were the painters and sculptors of Italy indebted to the art of Byzantium for the tradition of that ideal mode of conception to which the term classical is peculiarly applied, but artists in every department derived thence the elements of that technical knowledge without which the embodiment of such conceptions is impossible. This practical acquaintance with the technical rudiments of their respective arts, which could scarcely have been derived from a mere examination of ancient works, was communicated to the fathers of Italian art by living Byzantines, some of them probably the descendants of those whom barbarian conquests had driven into the East, and whom the conquests of a still more barbarous race from Asia now restored to Western Europe. It is impossible to doubt that modern art was largely indebted to this circumstance for the marvellous stride which it took immediately after the taking of Constantinople by the Turks. But though the chief value of B. A. may consist in its having thus transmitted to us the succession of antiquity, it was not devoid of original and individual character; and it is only so far as it possesses this, and not when regarded as a mere conservation of antique types and processes, that it takes rank as a school of art. The characteristic element in B. A. may be described as the earliest artistic recognition and representation to the senses of what was new and peculiar in Christian as opposed to heathen life. To the fullest extent to which it could claim a separate existence, B. A. was Christian art; and consequently in Germany, where the subject has received most attention, the two terms are frequently synonymous. The appearance of B. A., in this its only peculiar sense, dates from the age of Justinian, in the earlier half of the 6th c., and its productive period may be said to terminate with the conquest of the Eastern Empire by the Crusaders, 1204. But though its declension dates from this event, B. A. continued in considerable vigor till the final destruction of the Empire of the East,

1453; and even now may be seen as the inseparable handmaid of the Greek Church, both in Europe and in Asia. It is in this point of view, and particularly as the basis of artistic life in Russia, that B. A. possesses its chief living interest in our day. What Rome was to the Western, Byzantium was to the Eastern, European; and the relation of the latter to his mother-city, though commencing at a somewhat later date, continued during the whole of the middle ages

Though the inhabitants of Eastern Europe thus derived their traditions of antiquity from a meaner source than the Romanic nations, they received them more unbroken; and, from first to last, were subjected to their influences during a much longer period. To them the living voice and hand continued to communicate what for nearly a thousand years Italians, Spaniards, and Franks could seek and find only in the dead image and letter; and if anything still remains unrecorded of ancient thought, it doubtless dwells on Greek,

Church of St. Sophia at Constantinople:
Specimen of Byzantine Architecture.

and not on Roman or German tongues. Indolent, luxurious, and dissolute as their ancestors had been in classical times, the citizens of Constantinople were distinguished by an intellectual character, which, unfruitful and enfeebled though it was, was systematic, subtle, mystical, and pedantic. They were eminently an instructed people; but, like individuals whose glory is in the past, they were more conservative than original; and, however much of their productions may be despised as chaff, it is impossible to overestimate the value of the grains of gold which clung to their memories.

Byzantine Architecture. The typical form of B. architecture, at least as applied to ecclesiastical purposes, was fixed by the church of St. Sophia, which still stands as the great mosque of Constantinople. It was built, or rather rebuilt, by the orders of Justinian, the architects being Anthemius of Tralles, and Isodorus, the Elder, of Miletus, and completed A.D. 537. Though the largest and most magnificent, the church of St. Sophia was but one of 25 churches

erected in the capital, and of a vastly greater number of ecclesiastical structures with which the provinces were adorned by the pious emperor. The style thus introduced largely influenced the architecture even of Western Europe; and in St. Mark's at Venice, the churches at Ravenna and elsewhere on the Adriatic, and even in the cathedral of Aix-la-Chapelle, we have examples of churches almost purely Byzantine. The fundamental principle in the construction of Byzantine churches was an endlessly varied application of the Roman arch, while its exhibition in the form of the cupola was their most characteristic feature. In the St. Sophia, as was generally the case, the cupola covered the principal central portion of the church, and was supported by strong and lofty pillars, bound together by bold arches. To this central space were usually joined others of smaller size, which were covered by half-cupolas or arches of more ordinary construction. Though frequently in the form of a Greek cross, with the great cupola rising in the centre, and smaller or semi-cupolas surmounting the four arms, neither this nor any other plan was consistently adhered to in Byzantine churches. The windows were always semicircular, similar to those in the Romanic churches of Germany, and in our own Saxon or early Norman churches; but the doors were frequently square-headed, after the classical model. Many of the details, such as the square capitals tapering downward, and the bold projecting moldings ornamented with foliage, seem to have owed their origin entirely to the ingenuity of Byzantine architects. The earlier Byzantine churches were profusely ornamented with mosaics, which, after the admixture of the Gothic element, and the adoption of the pointed arch, gave place to fresco-paintings. The constant use of the Apse (q.v.) is, after the cupola, perhaps their most marked feature. The following division into periods, though, like most divisions of the kind, somewhat arbitrary, has the authority of M. Couchaud, an eminent French architect, in its favor, and is, apparently, adopted by Parker: 1. From the time of Constantine to the middle of the 6th c.; 2. From the beginning of Justinian's reign to the 11th c., which comprises the greater part of the existing buildings of the pure Byzantine type; 3. From the 11th c. to the conquest of Greece by the Turks, when the influence of the Venetian conquests is apparent in the intermixture of Italian and Gothic details and characteristics.

Byzantine Column.

Byzantine Sculpture. When contrasted with the ignoble, tasteless, and meaningless productions of the later plastic art of Rome, that of Constantinople claims admiration and respect. The figures are not deficient in dignity either in form or in attitude, and a deeply Christian sentiment is traceable both in their general conception, and in

their rich and significant symbolical accompaniments. In sculpture, as in architecture, the peculiar Byzantine type first exhibits itself toward the beginning of the 6th c. Together with unmistakable reminiscences of the antique, it shows characteristics as unquestionably oriental. The figures are positively laden, not with drapery alone, but with costume, which obscures the nobler and freer lines in which the ancients delighted. The execution is careful, even painful. All this becomes more and more the case as time advances, the earliest Christian works, and those immediately suggested by the antique, exhibiting such faults in only a limited extent. Down to the 12th c., the defects above noted were the worst which could be laid to the charge of B. sculpture, and it is scarcely earlier than the 13th c. that it assumes that mummy-like aspect by which it is too generally known. The art of carving in ivory was practiced with great success at Constantinople, and in the examples of it which remain, the gradual decline—the *benumbing process*, as it has been aptly called — may be traced with great distinctness. Of this species of work, in its earlier and better time, a fine specimen in alto-rilievo of the 'forty saints' may be seen in the museum at Berlin. The decorations of the churches, and of the sacred vessels used in the service of the altar, formed no insignificant objects of art in the better Byzantine period. Cups, plates, lamps, candlesticks, crosses, and the like, were either of gold or silver, and frequently adorned with jewels, while the altar itself, the chancel, and sometimes the whole interior of the church, were covered with precious metals, the panels being adorned with mosaics or frescoes.

Byzantine Painting. The same characteristics above ascribed to the sculpture belonged to the pictorial efforts of the artists of Byzantium, and of the neighboring countries whose artists were mostly their imitators. The execution was careful and anxious rather than skilful, and such skill as remained was exhibited in the mechanical perfection with which the gilding of the backgrounds and other details were managed. Of Byzantine pictures, the best existing specimens are in Italy, and belong especially to the school of Sienna. The picture of the Virgin in the church of St. Domenico at Sienna, by Guido, bearing date 1221, deserves special mention. Much labor was expended on the illumination of MSS. of the Scriptures, and of these many beautiful examples, as fresh as when they were painted, may be seen in most of the larger public libraries of Europe. The chief interest attaching to B. painting consists in the parental relation in which it stood to the art of Italy. Cimabue may be regarded as its immediate heir: and in the works of Giotto, Leonardo da Vinci, Pietro Perugino, and even of Raphael in his earlier time, the traces of the inheritance are unmistakable. See Painting.

BYZAN'TINE EMPIRE, styled also the EAST ROMAN, EASTERN, or GREEK EMPIRE: founded A. D. 395, when Theodosius the Great, at his death, divided the Roman empire between his two sons, Arcadius and Honorius. The former, a weak and luxurious character, was made emperor of the eastern division, formerly included under the prefectures of the East and of Illyricum—namely, Syria, Asia Minor, and Pontus, stretching along the shores of the Black Sea in Asia; Egypt in Africa; and Thrace, Mœsia (now Bulgaria), Macedonia, Greece, and Crete in Europe. Arcadius left the government of the empire in the hands of his minister, Rufinus, from whom it passed to the eunuch Eutropius, and afterward to Gainas, the murderer of Rufinus. Gainas fell by his ambition in 401, and the shameless and avaricious Empress Eudoxia ruled until death, 404. See ARCADIUS. After Theodosius II., a minor, under the guidance of the prefect Prætorio Anthemius, had held the reins during six years, he resigned the government in favor of his sister Pulcheria (Augusta), who ruled powerfully while her brother was kept apart from all state affairs. Western Illyria (comprehending Pannonia, Dalmatia, and Noricum) was ceded to the Eastern empire by the Roman emperor, Valentinian III.; and after several victories achieved by the Byzantine general, Ardaburius, over the Persians, a part of Armenia also was annexed. Nevertheless, Thrace and Macedonia could be secured from the destructive conquests of Attila only by the payment of tribute. After the death of Theodosius II., Pulcheria married the senator Marcianus (450–457), whose firmness repelled the invasions of Attila. Marcianus was followed by Leo I., surnamed Macella (the Butcher), a Thracian of low birth, but elevated to the throne by the commander-in-chief, Aspar, who, being himself an Arian, would not venture to encounter the perils that sovereignty might have entailed on one of his religious views. Leo II., grandson of the former, succeeded, but died after a few months, in consequence of which the crown came into the possession of his father, Zeno (reigned 474–491), who was banished by Basiliscus (475), but who re-ascended the throne 477. Though a weak and unpopular ruler, he contrived to retain his power in spite of several serious revolts. The internal distraction of the empire, to which, as at other times, religious strifes added considerably, increased greatly during the reign of Zeno, and the invasions of the Goths were prevented only by gifts and stratagems. Ariadne, widow of Zeno, by her second marriage raised the courtier Silentiarius to the throne under the title Anastasius I. (reigned 491–518). By the help of the Goths this monarch overthrew, after a six years' contest, the robber tribes of Mount Taurus. A new enemy, however, now appeared on the Danube in the Bulgarians, against whose desolating raids Anastasius built the Long Wall, to protect the peninsula on which Constantinople lies. The war with the Persians also broke out anew during his reign, and religious tumults often purpled the streets of Constantinople

itself. After his death, the army raised Justinus I. to the throne. He maintained his position mainly through the favor of the clergy, whom he had conciliated by his severe persecution of heretics.

His nephew, Justinian (q.v.), succeeded (reigned 527–565), and became celebrated by his code of laws, and by the victories of his great generals, Belisarius (q.v.) and Narses (q.v.). But the rapid decline of the empire after his death showed that he had not been able to give it internal consolidation or vitality. It was during the reign of Justinian that those pestilent contests of the Blues and Whites against the Greens and Reds (political factions so named from the colors respectively worn) first attained any consequence; and though the first disturbance was terribly chastised by Belisarius, 532, they continued to distract the capital periodically till the 7th c. Justin II. (reigned 565–578), a weak man, governed by his wife, Sophia, yielded a part of Italy to the Longobards, was unsuccessful against the Persians, allowed the Avari to plunder the Danubian provinces, and ultimately became insane through vexation and anxiety. Tiberius, the captain of the guard, was then made regent, and after the death of Justin II., received the imperial dignity. He ruled with mildness and prudence (578–582), purchased a peace with the Avari, concluded the war with Persia, and left as his successor the commander-in-chief, Mauricius, who reigned 582–602. Having replaced on the throne the Persian king, Kosroes II., who had been banished by his subjects, he thus secured the peace of his eastern frontiers; but, on the other hand, the war against the Avari did not prosper. His niggardly treatment of the army caused a military insurrection, in which he was slain with his son; and Phocas, one of his generals, was elevated to the throne. Phocas proved a bad ruler. Through his monstrous vices, tyranny, and incapacity for government, the empire lapsed into still deeper anarchy. Suddenly, however, a deliverer appeared in the person of Heraclius (q.v.), son of the exarch or gov.gen. of Africa, who headed a conspiracy, marched to Constantinople, overthrew the tyrant, and ascended the throne, 610. But great as was the genius of Heraclius, he had to submit to 12 years of defeat before he could organize and discipline a victorious army. In 622, he opened those magnificent campaigns in which the power of Persia was crushed, and which, in the opinion of Gibbon, were equal to those of Scipio or Hannibal. He lived, however, to see more formidable foes in the Arabs, who, inspired by fanatic zeal, and led by the Caliph Omar, captured, 635–641, the countries on the Euphrates, with Syria, Judæa, and Egypt. The power of the Greeks, which was demanded to resist the Arabian invasions, was miserably divided and weakened by their unending religious quarrels, especially the controversy of the Orthodox against the Monothelites (q.v.). The empire was breaking asunder, and Heraclius, now worn out with the fatigues of war, had abandoned his enfeebled senses to pleasure, and his enfeebled intellect to metaphysical

discussions of a theology without life. He died 641 Constantine III., who succeeded his father, Heraclius, also died soon after, and was followed by Heracleonas, who lost the crown, and was mutilated in an insurrection. The next ruler was Constans, son of Constantine III., who ruled 642–668, made himself odious by cruelty, and perished in an insurrection. His son, Constantine IV., Pogonatus (reigned 668–685), enforced a treaty of peace on the invading Arabs (675) by his successful use of the Greek fire in warfare. On the other side, he was compelled to pay tribute in 680 to the Bulgarians, who had established themselves in ancient Mœsia. Justinian II. (reigned 685–711), son and successor of Pogonatus, was victorious in war against the Monothelite Maronites, but was defeated by the Bulgarians (688), and by the Arabs (692). His cruelty caused an insurrection, at the head of which was Leontius, who, 695, deposed him, cut off his nose (hence his surname *Rhinotmetus*), and banished him to the Tauric Chersonese; in 705, he was restored to the throne, but adversity had taught him no wisdom A part of his subjects revolted, and the king, abandoned by his army and by the Bulgarians, was assassinated 711. With him the dynasty of Heraclius expired.

Philippicus Bardanes (the leader of the last insurrection against Justinian II.) was next raised to the throne (711); but having made himself odious by favoring the metaphysical tenets of the Monothelites, he was deposed, and brutally deprived of eyesight (713). His successor, Anastasius II., prudently screened himself from a mutinous army by retiring into a monastery (716), and left the crown to Theodosius III., who abdicated 717, impelled by the fact that Leo, the Isaurian, gen. of the army of the East, did not recognize him, and marched with hostile intent to Constantinople. Leo (q.v.) himself ascended the throne, 717, and drove back the Arabs from Constantinople, but unhappily gave occasion, 726, for that contest concerning the worship of images, which rent the empire for more than a century. In 728, the exarchate of Ravenna was lost, and the eastern provinces became the prey of the Arabs, over whom, however, he won a great victory in Phrygia. He died 741. Constantine V. (reigned 741–775), son of Leo III., on account of his zeal as an iconoclast, was hated by the monks, who gave him the surname 'Copronymos,' because (according to their malicious and uncleanly statement) he had polluted the font at his baptism He was a brave ruler, recovered from the Arabs parts of Syria and Armenia, and ultimately defeated the Bulgarians, against whom he had long been unsuccessful. His son, Leo IV. (reigned 775–780), was a mild ruler; but by the ability of his generals he made the boundaries of the empire secure against the Arabs. After him, Constantine VI. ascended the throne under the guardianship of his ambitious mother, Irene (q.v.), who raised a powerful party in favor of image-worship. Constantine having made an attempt to liberate himself from the influence of his mother and her paramour, Stauratius, Irene barbar-

ously caused him, her own son, to be blinded (797). He died soon after this atrocity; and Irene, who had boldly conceived the design of marrying the Emperor Charlemagne, and thus uniting the east and west of Europe in one vast realm, excited the opposition which, 802, placed her treasurer, Nicephorus, on the throne. Irene was banished to Lesbos, where she died 803. Nicephorus, who fell in battle against the Bulgarians (811), was succeeded by his son, Stauratius, who soon yielded the throne to his brother-in-law, Michael I., from whom it was taken by the Armenian general, Leo V., a powerful ruler, who conquered the Bulgarians, but fell (820) in a conspiracy excited by his zeal against image-worship. Michael II., the Stammerer, was raised from a dungeon to the throne, and ruled till 829. In his reign, Crete and Sicily passed into the hands of the Arabs. Under the rule of his son, Theophilus, praised by the Byzantine historians for his love of justice (reigned 829–842), the general, Manuel, gained some indecisive victories over the Arabs. Theodora, widow of Theophilus, and guardian of Michael III. (reigned 842–867), brought the controversy about images to a close at the council of Nicæa (842), when the worship of these was fully sanctioned and reintroduced. During this reign, the government busied itself in the persecution of the Paulicians (q.v.), while the Arabs devastated the Asiatic provinces. Theodora, having been banished to a convent by her son, the government was for some time held by Bardas, uncle of Machael III., and after his assassination, by Basilius I., the Macedonian, who caused Michael to be put to death, and afterward ruled ably 867–886. Though on the whole Basilius was successful against the Arabs, the latter contrived to make themselves masters of Syracuse. His dynasty (the Macedonian) maintained itself on the Byzantine throne, with some few interruptions, until 1056. The reign of his son, Leo VI., the Philosopher (886–912), was not prosperous. The inroads of the Bulgarians and of the Arabs, who, 904, plundered Thessalonica, continued to increase during the government of his son, Constantine VII., Porphyrogenitus, who ruled mildly but feebly (912–959). Under his son, the dissolute Romanus II. (reigned 959–963), Crete was retaken from the Arabs by the vigor of his general, Nicephorus Phocas, who, on the death of the emperor, married his widow, Theophania. She, however, caused him to be murdered in 969, as she wished to marry John Tzimiskes, who ruled till 976, and, like his predecessor, was victorious against the Arabs and Bulgarians, as also against the Russians, who about this time began to emerge from obscurity as an enemy of the Byzantine power. His successor, Basilius II. (reigned 976–1025), son of Romanus, conquered the Bulgarian kingdom, and attached it as a province to the empire, which it remained till 1186, when it again became independent. His brother, Constantine VIII. (reigned 1025–1028), was of a different character. Romanus III. next ascended the throne, but was assassinated by his wife, Zoe, a profligate but crafty princess, who

raised successively to the imperial dignity Michael IV. (1034), Michael V. (1041), and Constantine IX. (1042). Meanwhile, Russians and Arabs devastated the realm. In Asia, the Seljuk Turks proved dangerous enemies, while in Lower Italy the Normans narrowed the Byzantine power to the possession of Otranto. After Constantine's death, 1054, Theodora, sister of Zoe, was elected empress, and on her death, 1056, Michael VI. assumed power; he wa deposed by Isaac I., Comnenus.

With Isaac I., Comnenus, who came to the throne 1057, the dynasty of the Comnenian emperors began. He re tired to a monastery (1059), and was succeed by Constantine X., whose widow, Eudocia, married Romanus IV. and raised him to the throne. Romanus was deposed 1071 by Michael VII. (son of Constantine X.), who, in his turn, was dethroned by Nicephorus III. (1078), who reigned till 1081, when he was deposed by Alexius I., Comnenus (q.v.), (reigned 1081–1118). This last reign was marked by the commencement of the Crusades. The successors of Alexius—his son, Kalo-Joannes (reigned 1118–43), and Manuel I. (reigned 1143–80)—were able rulers, and victorious in conflicts with the Turks. Manuel's son, Alexius II., was murdered by his guardian, Andronicus (grandson of Alexius I.), who raised himself to the throne. He was the last prince of the Comnenian dynasty, and fell in an insurrection excited by his own cruelty, 1185.

After the first turbulent reign of Isaac II., who was blinded and deposed by his brother, Alexius III., who took the surname of Comnenus 1195, the Crusaders restored Isaac to the throne (1203), and also crowned his son Alexius IV.; but the restless citizens of Constantinople elected Nicolas Kanabus, who took the title of Alexius V., and, pursuing the usual bloody course, put his predecessor to death.

In 1204, the French and the Venetians (collectively named *Latins*) advanced on Constantinople, and captured the city, April 12, having made themselves masters of the European provinces. The whole was divided into four parts, of which the first, including the metropolis, fell to the lot of Baldwin, Count of Flanders, who was made emperor, and to whom the other participants in the expedition did fealty for their respective shares. The Venetians obtained the coasts of the Adriatic and Ægean seas, a part of the Morea, and several islands; Bonifacius, Count of Montferrat, obtained Macedonia and part of Greece; several dukedoms, countships, etc., also were established at Athens, Philippopolis, and other places for French knights; while a number of Greek princes, both on the mainland and in the islands, maintained their independence. In the west of Asia Minor, Theodorus Lascaris, who had been elected emperor at Constantinople, formally transferred the seat of government to Nicæa; and finally, in the n.e. of Asia Minor, the governor of the province of Colchis, Alexius Comnenus, ruled at Trebizond with absolute authority; while one of his successors, John Comnenus, even assumed the title of em

peror. At Constantinople, neither Baldwin nor his successors could strengthen the sinking empire. Baldwin himself died (1206) a prisoner in the hands of the Bulgarians. After him came his brother Henry, who ruled bravely and wisely till 1216. For the next four years, the empire was actually without a ruler, and a prey to utter anarchy. In 1221, Robert, son of Peter, Count of Auxerre and Courtenay, came to the throne, and was succeeded by John of Brienne, titular king of Jerusalem (reigned 1228–37): and the latter by Baldwin II. (reigned 1237–61). During these reigns a great part of the empire was seized by John Vatazes, successor of Theodorus Lascaris of Nicæa (reigned 1222–55). This ruler was followed in Nicæa by Theodorus II. (reigned 1255–1259), whose son, Johannes, during his minority, was superseded by Michael VIII., Palæologus, who, by the help of the Genoese, captured Constantinople (1261, July 25), and thus put an end to the Latin dynasty; though some few Latin principalities maintained themselves till the fall of the Byzantine empire.

Michael, the first of the Palæologi, a powerful prince, really endeavored to strengthen the realm; but by his unhappy attempt to unite the Greek Church with the Latin, from which it had decisively separated (1054), he gave great offense to the clergy and the people. His son, Andronicus II., who came to the throne, 1282, re-established the Greek ritual. After the death of his son and co-regent, Michael IX. (1320), Andronicus II. was compelled to divide the throne with his grandson, Andronicus III., who became sole emperor, 1328. This monarch unsuccessfully opposed the Turks, who took Nicæa and Nicomedia 1339, and wasted the European coasts. He died 1341. Under his son, Johannes V., the Turks first gained a firm footing in the European provinces, and spread themselves from Gallipoli (which they captured 1357) over other districts. Sultan Murad took Adrianople, 1361, and made it the seat of government. He and his follower, Bajazet, conquered all the Byzantine territories as far as Constantinople. Manuel II., son and successor of Johannes, was besieged in Constantinople by Bajazet, who defeated an army under Sigismund of Hungary, at Nicopolis, 1396, and compelled the Byzantine monarch to cede to the Turks one of the main streets of the city, which was saved from capture only by Timur's incursions into the Turkish territories, 1402. By this diversion Manuel recovered some portion of the Byzantine provinces; but made so little use of the occasion that, 1422, the metropolis was again besieged by Murad II., who, after he had overthrown the force sent to aid the emperor by Ladislaus, King of Hungary, at the battle of Varna, made Constantinople, in 1444, the limit of the domains of Johannes VI., son of Manuel, and compelled him to pay tribute. Constantine XI., brother of Johannes, bravely but fruitlessly contended against the overwhelming Turkish forces, and fell heroically in the defense of Constantinople, which was captured by Mohammed II., 1453, May 29. when the

B. E. was brought to a close. The petty Latin princes here and there in Greece, and the despots, Demetrius and Thomas, who ruled in the Morea, were subdued by Mohammed 1460; while David, a member of the Comnenian dynasty, the last emperor of Trebizond, submitted 1461.

It has hitherto been usual for authors dealing with the bloody record of dynastic crimes in the B. E. to affirm that the history of the world never witnessed so degraded a caricature of imperial government. Against such summary statements Mr. Freeman and others energetically protest; declaring that careful study brings a fairer side into relief, and that, on the whole, the history of the fall of the B. E. is the record of a noble struggle against overwhelming odds. This opinion, if judged too favorable regarding the whole period of the B. E., may perhaps be justified in relation to the closing epoch of its history.

The constitution of the B. E. was founded on the institutions of Diocletian and Constantine the Great, and was purely despotic. The emperors, who were consecrated by the patriarchs of Constantinople, claimed, as the true descendants of the Cæsars, a sovereignty over the West as well as the East, and styled themselves 'rulers of the Romans,' even after Charlemagne had founded a new dynasty. Though great influence was at various times exercised by the clergy as well as by women, courtiers, and ministers, the emperors were pure autocrats, having supreme power in all departments of government, and being themselves superior to all laws. By pompous titles, by great splendor of costume, and by a strict observance of an elaborately minute court ceremonial, as well as by the cruel penalties inflicted for any insult offered to the imperial dignity, or to the dignity of the emperor's relatives, they kept themselves sacredly apart from the people. Gradually everything disappeared that might have been a check upon the utter despotism of the supreme power. As early as the 6th c., the consulate was absorbed in the mass of imperial honors, while the traces of the senate which Constantine had established at Byzantium, and which was composed of those on whom the emperor had bestowed the dignity of patriciate, as well as the chartered privileges of the towns, had entirely vanished in the 10th c. The privy council, to whom the conduct of the state was in trusted, was arbitrarily chosen by the emperor. The state-officials were very numerous, and their respective ranks carefully distinguished. They were raised far above the populace by titles and privileges, but were ut terly dependent on the throne. Among these, the *Domestici* (including many eunuchs), claimed the highest rank as immediate attendants on the emperor.* The rank of the *Curopalates*, who had charge of the four chief imperial palaces, became, in course of time, subordinate to that of the *Protovestiarius*, who was invested with the highest dig nity of all. The Domestici were made commanders-in-chief of the army. Among them, the *Domesticus* of the East (styled, *par excellence*, *Megadomesticus*) held the highest rank, and finally, under the Palæologi, was considered

the first civil and military officer of the realm. The provinces were ruled by governors bound to contribute certain sums to the royal revenue, which gave rise to oppressive exactions. No distinction was made between the state-revenue and the privy purse. For military service, the land was divided into districts (*Themata*); and the army, down to the later times, consisted almost entirely of foreign mercenary troops, the imperial body-guard, or *Spatharii*, mainly Germans, holding the highest rank. The admiral of the fleet was styled *Megas Dux*. In the midst of constant internal and external disturbances the administration of justice was grossly neglected and abused, though Justinian and other emperors earnestly endeavored to establish just laws. See BYZANTIUM: CONSTANTINOPLE.

BYZAN'TINE HISTORIANS: Greek writers who have dealt with the history of the Byzantine empire. They are divided into three classes—1. Those whose works refer exclusively to Byzantine history; 2. Those who professedly occupy themselves with universal history, but at the same time treat Byzantine history at disproportionate length; 3. Those who write on Byzantine customs, antiquities, architecture, etc. The B. H. are far from faultless, yet, as they are the only sources of information regarding the vast empire of the East, they are invaluable to us. The most interesting and instructive among them, however, are those who confine their attention to a limited number of years, and to the events which passed under their own observation, or in which they took part. The works of the principal B. H. were collected and published at Paris, 36 vols., with Latin translations under the editorship of P. Philippe Labbé, a Jesuit, and his successors (1648–1711). This magnificent collection was reprinted, with additions, at Venice, 1727–33. In 1828, Niebuhr, assisted by Bekker, the Dindorfs, and others, began a *Corpus Scriptorum Historiæ Byzantinæ*, carried on till 1855, and continued in 1872 by the *Bibliotheca Græca Medii Ævi*.

BYZ'ANTINES, in Numismatics: coins of the Byzantine empire. Byzantine coins are of gold, silver, and bronze, bear impressions distinct from those of the earlier Roman coins, and were copied in several countries where the Byzantine standard was adopted. The commercial relations of the Eastern empire served to distribute its coinage over almost all the then known world. It was current in India, as well as in the n. of Europe. Recently an increased attention has been paid to the study of Byzantine coins as aids to history.—Saulcy, *Essai de Classification de Suites Monétaires Byzantines* (Metz, 1836). See BEZANTS.

BYZANTIUM, *bĕ-zăn'shĭ-ŭm:* city on the Thracian Bosporus: founded by emigrants from Megara B.C. 667; rapidly rose to importance as a seat of commerce Its position was at once secure and enchanting; it commanded the shores of Europe and Asia, had magnificent facilities for trade, and was encircled with rich, picturesque, and

varied scenery. After a time of subjugation under Darius Hystaspes, B. was liberated from the Persian yoke by Pausanias. With other Grecian seaports, B. revolted from Athens B.C. 440, but was captured by Alcibiades, B.C. 408. Lysander recovered it for the Lacedæmonians 405. Shortly afterward it renewed its alliance with Athens, and in 390, Thrasybulus altered its form of government from an oligarchy into a democracy. When Athens again acquired dangerous importance as a naval power, B., B.C. 356, leagued itself with Chios, Rhodes, and King Mausolus II. of Caria, and crippled the trade of Athens; with which, however, it again formed an alliance, through the influence of Demosthenes, in opposition to Philip of Macedon, who, B.C. 341–340, vainly besieged Byzantium. Under Alexander the Great, B. retained a degree of independence. For some time, B. was tributary to the Gauls, who settled in Thrace, after the death of Brennus (B.C. 280). After the second Punic war, when the Romans began to interfere in the affairs of Grecian and Asiatic cities, B. attached itself to Rome, and, retaining almost entire its former liberties, maintained also its commercial importance. In the civil war between Septimius Severus and Pescennius Niger, B. sided with the latter. It was therefore besieged by Severus, and, after a brave defense of three years' duration, was captured A.D. 196 and reduced to ruin. Severus, repenting of the desolation which he had made, rebuilt a part of the city under the name of *Augusta Antonina*, and ornamented it with baths, porticos, etc. Caracalla restored to the inhabitants their ancient privileges; and, in 330, under the name of New Rome or Constantinople, it was made the metropolis of the Roman empire. See CONSTANTINOPLE: BYZANTINE EMPIRE.

C

C or c, *sé:* the third letter of the Eng. alphabet, and a consonant, has two sounds—(1) as *s* in *face;* and (2) as *k* in *cane.*

C is generally pronounced as *k* (1) when followed by one of the vowels *a, o, u,* as in 'cake,' 'becoming,' 'concuss'; (2) when followed by a consonant, except *h,* as in 'accord,' 'clime'; (3) when it terminates a word as in 'physic,' 'music,' 'zinc.'

C is generally pronounced *s* when it comes before one of the vowels *e, i, y,* as in 'avarice,' 'cipher,' 'fancy.'

C is the third letter in all the alphabets derived from the Roman. It corresponds in place to the Greek gamma (*Γ*), and had originally the same sound—viz., that of *g* in *gun;* as is expressly recorded, and as is proved by very old inscriptions, on which we read *leciones, lece,* for what were afterward written *legions, lege.* This medial or flat guttural sound of *c* was at an early period of Roman history lost in the sharp guttural or *k*-sound (see ALPHABET), and this continued to be the pronunciation of the letter *c* in Latin down at least to the 8th c. of the Christian era, not only in such words as *comes, clamo,* but also before the vowels *e* and *i.* Such Latin words as *Cicero, fecit,* are uniformly represented in Greek by *Kikero, phekit;* and in the times of the Empire the Germans borrowed *Kaiser, keller,* from *Cæsar, cellarium.*

It seems difficult at first sight, to account for the same letter having sounds so different as those heard in *call* and in *civil.* The beginning of the transition is to be found in the effect produced upon certain consonants by their standing before *i* followed by a vowel. Thus, in *nation, ti* tends to, and practically reaches, the effect of *sh;* and out of *diurnal* has sprung *journal.* In such combinations, *i* is originally a semi-vowel having the force of *y,* and it is easy to see that *tyon, dyur,* pronounced in one syllable, cannot but slide toward or into the sibilant or hissing sounds of *shon, jur.* A similar effect is produced on the *k*-sound before *ia, iu, io;* in Lucius, Porcia, or rather Lukyus, Porkya; *ky* tends to slide into a hissing sound similar to that of *ty* and *dy.* This tendency showed itself early in the Latin tongue; and in the vulgar Latin of later ages, and in the Romanic tongues that sprang out of it it fully developed itself, so that the Italian came to pronounce *Lucia* as if written *Lutshia.* Combinations like *ceo, cea,* are little different from *cio, cia,* and would naturally follow the same course; and the *s* sound being once associated with the letter *c* in these

positions, was gradually extended to it in cases where the *c* or *i* was not followed by a vowel.

The Anglo-Saxon alphabet resembled the Roman, from which it sprang, in having no *k*, and in always using *c* with the sound of *k; king* and *keen* were spelled *cyning* and *cene*. It was also without *q*, for which *cw* was used—*quick* being spelled *cwic*. By a process analogous to that described above, such Anglo-Saxon words as *ceorl*, *ceosan* (pro. *kyorl*, *kyosan*), became transformed into the English *churl*, *choose*. And this suggests a natural explanation of the multitude of cases where the *c* of the Latin has been transformed into *ch* in French, and has passed in this form into English—e. g., Lat. *caput*, Fr. *chef*, Eng. *chief;* Lat. *caminus*, Eng. *chimney;* Lat. *carmen*, Eng. *charm*. For as the Anglo-Saxons turned the *karl* or *korl* of the other Gothic nations into *kyorl*, so doubtless the Romanized Gauls corrupted the pronunciation of the Latin *camera*, for example, into *kyamera* (compare Eng. *cart*, pronounced by some *kyart*, which would then really slide into *chambre*.

In the other German alphabets, derived partly from the Roman and partly from the Greek, the Greek *kappa* or *k* is used almost to the exclusion of *c*, which, in German, Swedish, etc., appears only in words borrowed from the Romanic languages. See letter K.

In modern English, *c* is pronounced like *k* before the vowels *a*, *o*, *u*, and like *s* before *e*, *i*, and *y;* and where the sharp guttural sound has to be represented before *e*, *i*, and *y*, the Germanic *k* has superseded the Anglo-Saxon *c*, as in *king*, *keen*. So far as mere sound is concerned, *c* is a superfluous letter in English; and in every case its power could be represented either by *k* or *s*. In the corresponding words of the several Aryan languages, we find various substitutions for *c*, thus: Lat. *calamus*, Eng. *halm* (stalk), Rus. *soloma;* Lat. *cord-*, Eng. *heart*, Rus. *serdtse;* Lat. *collum*, Ger. *hals* (neck); Lat. *acer* (sharp), Fr. *aigre*, Eng. *eager;* Lat. *duc-* (lead or draw), Ger. *zog*, Eng. *tug;* Gr. *pepo*, Lat. *coquo*, Eng. *cook;* Lat. *dictus*, Ital. *ditto*. C. sometimes disappears before *l* and *r;* thus: Gr. *kleo* (to sound one's fame, allied to *kaleo*, to call or shout), Lat. *laudo*, to praise, Ger. *laut*, voice, Eng. *loud*, Old Ger. *hlud*, fame (hence Hludwig or Clodowig, Clovis, Louis).

C, in Music: one of the notes of the gamut. The scale of C major has neither flats nor sharps, and therefore is called the natural scale. The different octaves of the gamut, beginning with C, are called by the Germans the great, small, one-stroked, two-stroked, etc. C. is also the sound on which the system of music is founded, and from which the mathematical proportions of intervals are taken; that is, a string of a given length sounding C, when divided into certain pro-

portions, is made to produce harmonically the intervals of the different fundamental chords.

C MAJOR: the first of the twelve major keys in modern music; beginning the natural scale, it has no signature.

C MINOR: the tonic minor of C major, has three flats for its signature—viz., B. flat, E. flat, and A. flat.

CAABA, or KAABA, n. *kā'ă-bă* [Ar. *ka'bah*, a square building]: a black sacred stone in the temple at Mecca, said to have been given by an angel to Abraham; the temple itself: see KAABA.

CAAING WHALE, *kaw'ĭng whāl* (*Globicephalus deductor*): cetaceous animal, which has been generally included by naturalists in the genus *Delphinus* with dolphins (q.v.) and porpoises (q.v.), being named by some *Delphinus melas* [Gr. black], by others *D. globiceps*, from the round form of its head, but which has recently been separated from the true dolphins, either as a species of porpoise (*Phocæna*), or as the type of a distinct genus, *Globicephalus*, characterized principally by the rounded muzzle, and the convex and rounded top of the head. The general form of the animal is like that of the common porpoise, but it is much larger, being from 16 to 24 ft. in length. The body is thick, its circumference at the origin of the dorsal fin, where it is greatest, being rather more than 10 ft., tapering toward the tail, which is deeply forked. The pectoral fins are remarkably long and narrow, fully 5 ft. in length, differing very much in this respect from those of every known cetaceous animal. The whole number of vertebræ is 55. The color is black, with a white streak from the throat to the vent; and the skin is beautifully smooth, shining like oiled silk.

The Caaing Whale feeds on cod, ling, and other large fishes, but also to a great extent on cephalopodous mollusca, the cuttle-fish, indeed, seeming to be its principal food. It is the most gregarious of all the *Cetacea*, great sholes or herds being usually seen together in the northern seas which it inhabits. These herds exhibit the same propensity with flocks of sheep, when pressed by danger, to follow their leaders, so that when they are hemmed in by boats, if one break through to the open sea, all escape; but if one is driven ashore, the rest rush forward with such blind impetuosity as to strand themselves on the beach, where they become an easy prey and rich prize to their pursuers. The appearance of a herd of caaing whales in a northern bay produces a scene of great excitement, and every boat is in requisition. From a single herd 50 to 100 whales are often captured, and it is recorded that 1,110 were killed, in the winter of 1809–10 at Hvalfiord, Iceland. The word *caaing* is not the Scottish form of *calling*, as has been supposed, but is a totally different Scotch word, which signifies *driving*. Caaing Whale

appears to be originally an Orkney or Zetland name. The same animal is known to sailors as the Black Whale, the Howling Whale, the Social Whale, and the Pilot-fish.—Another species of the same genus, *G. Rissoanus*, 9 or 10 ft. long, the male of a bluish-white color, the female brown, both sexes marked with irregular white lines and brown spots, is found in the Mediterranean.

CAB, n. *kăb* [Heb. *qabab*, to hollow]: in *Eastern countries*, a measure of capacity varying from 3 to 5 pints.

CAB, n. *kăb* [contraction for *cabriolet*]: a public one-horse carriage; [U. S.] the roofed part of a locomotive. CAB'MAN, n. the driver of a cab. CAB'STAND, n.

CABAGAN, *kâ-bâ-gân'*: thriving town, at the northern extremity of the island of Luzon, one of the Philippines. Pop. upward of 11,000.

CABAL, n. *kă-băl'* [F. *cabale*, a club, a party (see CABALA)]: a few men united secretly for some party purpose agreeing for political or personal ends to modify or sacrifice their principles, a junto: V. to design secretly; to intrigue. CABAL'LING, imp. CABALLED' pp. *-băld*. CABAL'LER, n. one who. *Note.*—In its modern sense of 'political intrigue or plotting,' *cabal* was used first in the reign of Charles II. in 1671, when, by 'a whimsical coincidence,' it was found to be formed by the initial letters of the names of the members of the cabinet—Clifford, Arlington, Buckingham, Ashley, and Lauderdale.—SYN. of 'cabal, n.': conspiracy; combination; plot; faction; junto; intrigue.

CABALA, n. *kăb'ă-lă*, or CAB'AL, n. sometimes CAB'AL-ISM, n. [Heb. *qabbâlâh*, tradition, mysterious doctrine]: among the Jews, certain unwritten principles of interpretation of the law having supposed mysterious and magical powers; a secret science or knowledge which the Jewish rabbins alleged they possessed, and by which they professed to be able to explain all Scripture difficulties, as by the combination of particular words, letters, and numbers found in Scripture; a secret or mystic study. CAB'ALIST, n. *-lĭst*, one skilled in the secrets of the cabala. CAB'ALIS'TIC, a. *tĭk*, or CAB'ALIS'TICAL, a. *-tĭ-kăl*, having a secret meaning. CAB'ALIS'TICALLY, ad. *-lĭ*; also spelled CABBALA (q.v.).

CABALLERO, *kâ-vâl-yā'ro*, FERNAN: pen name of Doña Cecilia Arron, otherwise known as Cecilia de Baer: Spanish novelist; abt. 1799–1877, Apr. 7: b. Cadiz; dau. of Bohl de Faber, long German consul there. She married, first, an officer of artillery; second, the Marquis de Arco Hermose; third, Don Antonio Arron, at one time Spanish consul in Australia. She lived mostly in Andalusia, to which she was devotedly attached, and rendered great service to Spanish literature

by her tales, which are marked by 'insight into the hearts of the people, and conscientious and artistic reproduction of the national life.' Some of them have been translated into every European language: the one best known in America is probably *La Gaviota,* or *The Sea-gull.* Her views were ultramontane and anti-republican to the last degree; 'she could not pardon anything done since the days of the Inquisition.' Mérimée called her 'the Spanish Sterne,' and Gustave Hubbard 'a female Chateaubriand.' She died at Seville.

CABALLINE, a. *kăb'ăl-līn* [L. *caballus,* an inferior riding or pack horse; Gr. *kaballes:* It. *cavallo:* F. *cheval*]: pertaining to a horse: N. a coarse variety of aloes used as a medicine for horses.

CABANIS, *kâ-bâ-nē',* Pierre Jean Georges: 1757–1808, May 5; b. Cosnac, dept. of the Charente-Inférieure, France: Physician, philosophical writer, and partisan of Mirabeau in the Revolution. When he had completed his studies in Paris (1773) he went to Warsaw as sec. to a Polish magnate. On his return to Paris he engaged in literary pursuits, from which he turned to an earnest study of medicine. At the outbreak of the Revolution he attached himself to the liberal side, but detested the cruelties which followed. For Mirabeau, whose opinions he received, he wrote a work on national education, published after the death of that great orator (1791). Cabanis was one of the Council of Five Hundred, afterward member of the senate, and administrator of the hospitals of Paris. His chief work, *Rapports du Physique et du Moral de l'Homme,* completed in 1802, gained its author considerable reputation as a writer and philosopher. The work shows power of observation and analysis, but is characterized by a sensationalism so absolute that it seems at first sight as if the author were burlesquing with grave irony the doctrines of his brother-materialists. He denies that the soul is an entity; it is only a faculty; and declares the brain to be merely a particular organ specially fitted to produce thought, as the stomach and the intestines perform the function of digestion.

CABARET, n. *kăb'ă-rĕt* [F.]: a house where liquors are retailed; a tavern.

CABATUAN, *kâ-bâ-tô-ân':* city of the province of Iloilo, on the island of Panay, one of the Philippines. It is on the banks of the river Tiguin, which so abounds with crocodiles that fishing is unsafe. Navigation is very uncertain, the river being sometimes nearly dry, while at others it overflows its banks, and deluges the surrounding country. The city was founded 1732. The people are engaged chiefly in the production of rice, and of cocoa-nut oil. Pop. 23,000.

CABAZERA, *kâ-bâ-zā'râ:* capital of the province of Cagayan, island of Luzon, Philippines. Tobacco is grown extensively in the province, and its manufacture

affords employment to large numbers of people. Pop. 15,000.

CABBAGE, n. *kăb'bāj* [OF. *cabus* or *cabuce*, round-headed: F. *caboche;* It. *capo;* old Sp. *cabo*, a head—from L. *caput*, the head]: a well-known vegetable; the *Brassĭca olĕrăcĕă*, ord. *Cruciferæ:* V. to grow as to form a head. CAB'BAGE-TREE, n. a species of palm-tree, whose terminal buds are eaten like cabbage; the *Arĕcă olĕrăcĕa*, and also *Euter'pĕ montāna*, ord. *Palmæ;* the *Audīra iner'mis*, producing the 'worm-bark,' ord. *Legumĭnōsæ.*

CABBAGE, v. *kăb'bāj* [F. *cabas*, a woman's work-bag] to purloin, said of a tailor who retains a portion of his patron's material. CAB'BAGING, imp. CAB'BAGED, pp. *-bājd.*

CABBAGE, *Brassĭca oleracea* (see BRASSICA): ord. *Cruciferæ:* a well-known vegetable and a plant in general cultivation for culinary purposes all over the temperate zones, cultivated to a considerable extent also for feeding cattle. It is a native of the rocky shores of parts of Europe, more plentiful on the shores of the Mediterranean than in more northern latitudes, and in its wild state is generally from a foot to two ft. high. This plant has been cultivated in Europe and in India from time immemorial; it has likewise been cultivated from an early period in gardens and about villages in India. Few plants show so great a tendency to vary in their form through cultivation; and among the varieties of this one species are reckoned several most esteemed culinary vegetables, such as Kale (q.v.) or Greens, Borecole, Colewort (q.v.), Savoy (q.v.), Kohl Rabi (q.v.), Cauliflower (q.v.), and Broccoli (q.v.)—plants which in their appearance and in the particular qualities for which they are valuable, differ greatly both from each other and from the original wild plant.

The wild cabbage has smooth sea-green leaves, waved and variously indented; the bolling of the leaves, or their forming close heads at a certain stage of the growth of the plant, so that the inner leaves are blanched, is peculiar to those cultivated varieties which commonly receive the name of cabbage.

The ordinary varieties of cabbage are often called by the general name of *White Cabbage*, to distinguish them from the *Red Cabbage*, which is of a deep brownish-red or purplish color, and is chiefly used for pickling, for which purpose it is much esteemed. The *Tree Cabbage*, or *Cow Cabbage*, is a variety cultivated for cattle, especially in the Channel Islands and the n. of France, of which the leaves do not close together into compact heads, but which is remarkable for its great height—reaching, when it is in flower, ten ft. on rich soils—and for its branching stem. The stems of this kind are sometimes used as stakes for pease, and even as cross-

spars for thatched roofs. The *Portugal* or *Tranxuda Cabbage*, also known as *Couve Tronchuda*, is a variety remarkable for its delicacy, and for the large midribs of its leaves, often used like sea-kale. It is an article of luxury like cauliflower, and requires somewhat similar cultivation.—Cabbage-seed is sown either in spring or autumn, and the seedlings transplanted in rows at distances of two ft. or upward, according to the size of the variety. They are often planted closer, and the alternate plants cut young for open greens, for which the sprouts that arise from the stem of some varieties after the head has been cut off are also used. Cabbages require a rich, well-manured soil, and the earth about the roots ought to be often stirred. They are very tender when young and when transplanted must be well shaded and watered till established. By sowing and planting at different dates and of different varieties, a succession is secured in the garden; and when winter approaches, part of the principal crop may be taken up and laid in a sloping position, so that only the heads are above the earth, in which way they are generally preserved without injury. In some places, cabbages are completely buried in the earth, the plants not being allowed to touch each other; and this method succeeds in peaty or sandy soils.

The cabbage, considered as food, contains more than 90 per cent. of water, and therefore, cannot be very nutritious.

CABBAGE BARK: see ANDIRA.

CAB'BAGE BUT'TERFLY: name common to several species of butterfly, the larvæ of which devour the leaves of cruciferous plants, especially of the cabbage tribe, and are popularly known as cabbage-worms or kale-worms. The LARGE CABBAGE BUTTERFLY, or Large White Garden Butterfly *(Pontia Brassicæ*, or *Pieris Brassicæ)*, is one of the most common of British butterflies. It is white; the wings tipped and spotted with black. The wings, when expanded, measure from $2\frac{1}{2}$ to 3 inches across. The antennæ terminate in an ovoid club. The female lays her eggs, which are conical and bright yellow, in clusters of 20 or 30, on the leaves of the plants which are the destined food of the caterpillars. The caterpillars, when fully grown, are about 1 inch or $1\frac{1}{2}$ inches long, and are excessively voracious, eating twice their own weight of cabbage-leaf in 24 hours. When fullgrown, they suspend themselves by their tails, often under ledges of garden-walls, or similar projections, and are metamorphosed into shining pale-green chrysalids, spotted with black, from which the perfect insect emerges, either in the same season or after the lapse of a winter—no longer to devour cabbage-leaves, but to subsist delicately upon honey. See INSECTS.—The SMALL CABBAGE BUTTERFLY, or small Garden White Butterfly, sometimes called the TURNIP BUT-

TERFLY (*Pontia* or *Pieris Rapæ*), very much resembles the Large C. B., but the expanse of the wings is only about 2 inches. The eggs are laid singly on the under side of the leaves of cabbages, turnips, etc., and the caterpillars, which are of a velvety appearance, pale green, with a yellow line along the back, and a yellow dotted line on each side, sometimes appear in great numbers, and prove very destructive. They bore into the hearts of cabbages, instead of merely stripping the leaves, like those of the last species, and thus are a greater pest, even when comparatively few. The chrysalis is of a pale reddish-brown color, freckled with black.—A third species, also common in Britain, the GREEN-VEINED WHITE BUTTERFLY (*Pontia* or *Pieris Napi*), very nearly resembles the small cabbage butterfly.—The excessive multiplication of these insects is generally prevented by small birds, which devour them and their caterpillars, and by insects of the *Ichneumon* (q.v.) tribe, which lay their eggs in the caterpillars, that their own larvæ may feed on them.

CABBAGE FLY (*Anthomyia Brassicæ*): of the same family with the house-fly, flesh-fly, etc., and of which the larvæ or maggots often do great injury to the roots of cabbages, and sometimes to those of turnips. It is of the same genus with the fly generally known as the Turnip Fly (q.v.), and also with the Potato Fly (q.v.), Beet Fly (q.v.), etc. It is about one-fourth of an inch in length, and half an inch in expanse of wings; of an ash-gray color; the male having a silvery-gray face, and a long black streak on the forehead; the female, a silvery-white face, without any black streak; the abdomen of the male is linear, that of the female terminates conically; the eyes of the male nearly meet on the crown, those of the female are distant, with a broad black stripe between them. The larva is very similar to that of the flesh-fly—yellowish white, tapering to the head, which has two black hooks. The pupa is rust-colored and horny.

CABBAGE MOTH (*Mamestra* or *Noctua Brassicæ*): species of moth, the caterpillar of which feeds on cabbage and turnip leaves, and is sometimes very destructive. The caterpillar is greenish-black, and changes to a brown pupa in autumn. The perfect insect is of a rich mottled-brown color, the upper wings clouded and waved with darker brown, and having pale and white spots, a yellowish line near the fringe, the fringe dotted with black and ochre, the under wings brownish and white.

CABBAGE PALM, or CABBAGE TREE: name given in different countries to different species of palm, the great terminal bud of which—the Palm Cabbage—is eaten like cabbage. The C. P. of the West Indies is *Areca oleracea*. The southern states of America have also their C. P. or Cabbage Tree, otherwise called the Palmetto (*Chamærops Palmetto*). See ARECA: EUTERPE: PALM: PALMETTO.

CABBALA, or CABALA (q.v.), *kăb'a-la* [from Heb. *kibbel*, to receive]: the received doctrine, by which is not to be understood the popularly-accepted doctrine, but that

inner or mystical interpretation of the Law which the Cabbalists allege that Moses received from God in the mount, and subsequently taught to Joshua, who in his turn communicated it to the seventy elders, and which has ever since been the treasure of the select Jews. Since the 12th c., the study of this secret lore has gradually resulted in a distinct school and literature, the elements of which, however, were already visible in the Alexandrian epoch, and the real or historical source of much of which is to be found, perhaps, in the eastern doctrine of emanation. In Philo, in the Talmud, etc., we certainly find theologico-philosophical conceptions, which were at a later period taken up and modified; but the first book on cosmogony is *Jezirah*, a production of the 7th c., attributed to Akiba. After the second half of the 12th c., the Cabbalistic doctrines, which had at first been confined to such high themes as God and creation, began to include exegesis, ethics, and philosophy, and so became a kind of mystical religious philosophy. The numerous cabbalistic writings composed during the three subsequent centuries, professed to teach the secret or mystical sense of Holy Writ, and the principles on which it is grounded, the higher meaning of the Law, as well as the method of performing miracles, by the use of divine names and sacred incantations. The Cabbalists, moreover, prepared books, which they attributed to the oldest authorities—for instance, *Sohar*, a work written in Aramaic, during the 14th c., and fathered upon Simeon-ben-Joachai, a scholar of Akiba, but written by Moses de Leon. This became the Bible of the Cabbalistic neophytes. The chief opponents of the Cabbalists were the philosophers, and in part the Talmudists. Toward the close of the 16th c., the Cabbalistic wisdom, which by that time had degenerated into magic and word-juggling, received a new impulse from its teachers in Palestine and Italy. Since the time of Reuchlin, many Christian scholars have investigated the subject.

CABECA DE VACA: See NUÑEZ ALVAR.

CABEIRI, *ka-bī'rī:* divinities anciently worshipped in Egypt, Phœnicia, Asia Minor, and Greece. The ancients have left very obscure notices of the C., and learned men have been unable to reach satisfactory conclusions with regard to them and their worship. It is certain that the worship had both its mysteries and its orgies, and it appears also that the C. were among the inferior divinities, and regarded as dwelling upon the earth, like the Curetes, Corybantes, and Dactyles, and were probably the representatives of the powers of nature.

CABENDA, *kâ-bēn'dâ*, or KABINDA, *kâ-bĭn'dâ:* seaport town of w. Africa, in Lower Guinea, on the right bank of the Bele, 40 m. n. of the mouth of the Zaire; lat. 5° 33′ s., long. 15° 40′ e. Having a good harbor, a fine situation, and a fertile soil, it has been called the paradise of the coast. It has considerable trade. Pop. abt. 16,000.

CABER, or CABAR, n. *kā'ber* [W. *keibr*, a rafter: Gael. *cabar*, a rafter, an antler]: in *Scot.*, a rafter; a large, strong pole, or trunk of a tree, in Highland games thrown in feats of strength.

CABES, *kâ'bes* or KHABS, *kâbs*, GULF OF (ancient *Syrtis Minor*): see SYRTIS.

CABET, *ka-ba'*, ÉTIENNE: 1798, Jan. 2—1856, Dec. 9; b. Dijon: French communist. He was educated for the bar, but turned to literature and politics. Under the Restoration, he was one of the leaders of the Carbonari (q. v.), and in 1831 was elected deputy for the dept. of Côte d'Or. Soon afterward he published a *History of the July Revolution* (1832), started a Radical Sunday paper, *Le Populaire* (1833), and, on account of an article in this paper, was sentenced to two years' imprisonment, but escaped to London. Here he wrote brochures against the July government, and began his communistic studies. After the amnesty, 1839, he returned to Paris, and published a *History of the French Revolution* (4 vols., 1840), bestowing great praise on the old Jacobins. He attracted far more notice by his *Voyage en Icarie* (1840), a 'philosophical and social romance,' describing a communistic Utopia. The work though shallow in thought and poor in style, obtained great popularity among the working classes of Paris. C. next proceeded to turn his 'philosophical romance' into a reality, and published (1847) in his journal, *Le Populaire*, the statutes for the formation of an 'Icarian colony' on the Red river in Texas, inviting his followers to emigrate. The first division sailed 1848, Feb. 2, but a short experience convinced them that Texas was anything but a Utopia. Their complaints did not deter C. from embarking at the head of a second band of colonists. On his arrival, he learned that the Mormons had just been expelled from Nauvoo, Ill., and that the place was deserted. The Icariens established themselves there 1850, May. C. governed, as a dictator, his petty colony till 1856, when he was deprived of his office, and obliged to flee to St. Louis, where he died.

CABEZA DEL BUEY, *kâ-bā'thâ dĕl bô-ā':* town of the new province of Badajoz, Spain, about 86 m. e.s.e. of the city of Badajoz; on the n. slope of the Sierra el Pedroso. It has manufactures of woolens and linens, and a trade in cattle and agricultural produce. Pop. 5,395.

CABEZON DE LA SAL, *kâ-bā-thōn' dė lâ sâl:* town of Spain, province of Valladolid, about 7 m. n.n.e. of the city of Valladolid. It is on the Pisuerga, and is notable as the scene of one of the first battles of the Peninsular campaign, in which the Spaniards were signally defeated by the French. Pop. 2,000.

CABIN, n. *kăb'ĭn* [F. *cabane*—from mid. L. *capanna* and *cabanna*, a little hut: It. *capanna*, a shed or hovel: W. *caban*, a booth or hut]: a small room or inclosure; a shed or hut; a small cottage or house; a small apartment in a ship: V. to confine in a cabin. CAB'INING, imp. CABINED, pp. *kăb'ĭnd.* CABIN-BOY, a boy who waits on the passengers

and officers of a ship. CABINET, n. *kăb'ĭ-nĕt*, a small hut or tent; a small private room or closet.

CABIN, *kăb'ĭn:* general name for an apartment on shipboard. In ships of war, the living-rooms of the admirals and captains are called 'state' cabins, and are fitted up with much elegance, with a gallery or balcony projecting at the stern. The chief officers below the captain have their cabins on either side of the main deck; while those of the subordinate commissioned officers are, in large ships, on either side of the lower or orlop deck. The cabins of a ship of war are usually inclosed by light panelling quickly removable when preparing for action.

CABINET, *kăb'ĭ-nĕt* [Ital. *gabinctto*]: a small chamber set apart for some special purpose, such as the conservation of works of art, antiquities, specimens of natural objects, models, and the like. From signifying the chamber in which such collections are contained, the term cabinet has recently come to be employed by us, in imitation of the French, to signify the collections themselves, and this even when they fill many rooms or galleries. It often means simply a small room appended to a larger one, when it is also called an anteroom, a retiring-room, and the like. See CLOSET.—CABINET PICTURE, a picture suited for a cabinet or small room. Cabinet pictures are generally small in size.

CABINET, in Political Affairs: see MINISTRY.

CABIRI: see CAEEIRI.

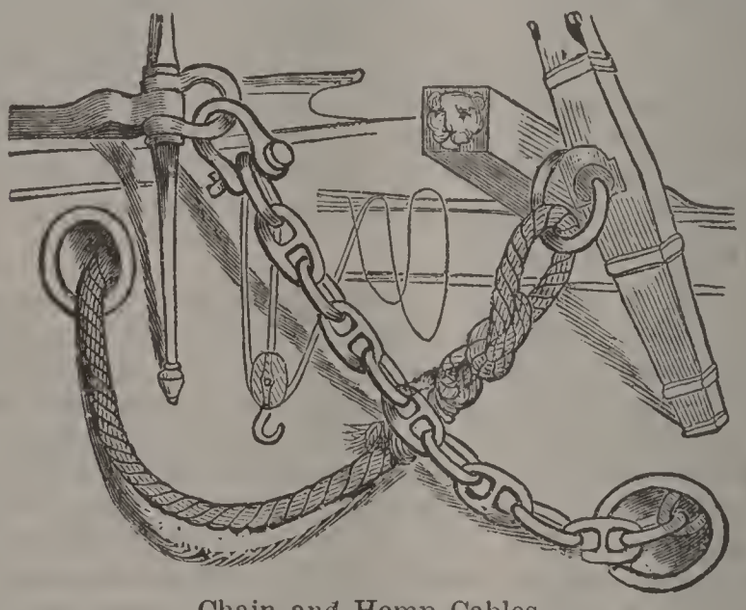
CABLE, n. *kā'bl* [F. *câble*—from mid. L. *caplum*, a cord, a cable—from L. *capĕrĕ*, to take hold of: Icel, *kadal;* Ar. *habl*, a rope]: a rope or chain of various degrees of thickness, used in ships; any heavy rope of wires, as for a suspension bridge; a submarine telegraph wire and its sheath: V. to send a message by the telegraphic cable or wire, as to England. CABLING, imp. *kā'blĭng*. CABLED, pp. *kā'bld:* ADJ. fastened with a strong rope. CA'BLET, n. *-blĕt*, a small cable. CABLE-MOLDINGS, also CABLINGS, n. plu. *kā'blingz*, in *arch.*, wreathed moldings resembling the twisted strands of a rope—much used in the later Norman style. CA'BLING, molding by which the hollow parts in the flutes of columns and pilasters in classical architecture are often partially filled. The cabling seldom extends beyond the third part of the shaft from the ground. STREAM-CABLE, a hawser rope which moors a ship in a sheltered place. A CABLE'S-LENGTH, about 600 ft. TO PAY OUT A CABLE, to cause a cable to run out of a ship. TO SLIP THE CABLE, to loosen it so that it may run out. CABLE-RAILROAD, a railroad operated by an endless cable under the roadway, driven by a stationary engine, the cars being attached to the cable by means of a grip passing through a slot in the roadway.

CA'BLE: either a large rope, or a chain of iron links, used chiefly on shipboard to suspend and retain the an-

chors. Rope cables are made of the best hemp, twisted into a mass of great compactness and strength. The circumference varies from about 3 inches to 26. A certain number of yarns are twisted to form a *lissum;* three lissums are twisted in an opposite direction to form a *strand;* and three strands are twisted (in the same direction as the yarns in a lissum) to form a *cable.* The number of yarns in a C. of given size is not always alike, because the yarns slightly vary in thickness; but the following is one among many tables which have been prepared relating to cables of 120 fathoms, and of the usual degrees of thickness:

Inches. Circumference.	Yarns.	Lbs.
3	= 48	= 192
6	= 174	= 696
9	= 393	= 1572
12	= 699	= 2796
15	= 1093	= 4372
18	= 1574	= 6296
20	= 1943	= 7772

Some cables are made with four strands, but three is usual. If a C. be twisted too much, it is stiff; if too little, it is weak. The strength of a C. of 18 inches' circumfer-



Chain and Hemp Cables.

ence is found to be about 60 tons; and for other dimensions, the strength varies according to the cube of the diameter. On shipboard cables receive the names of *chief* cables, *bower* cables, etc., according to the anchor to which they are attached. During the great war ending 1815, the largest ships in the British navy carried ten cables, most of which were about two ft., or a little more, in circumference. Although ships seldom anchor at a greater depth than 40 fathoms, it is not deemed safe to trust the anchor to one C. of the usual length; two are spliced together at the ends. The hempen cables now made are generally 101 fathoms; but 100 fathoms in practical seamanship denotes 'a cable's length,' and is really the length of a chain cable.

Chain Cables are made of links, the length of each of

which is generally about six diameters of the iron of which it is made, and the breadth about three and a half diameters. Chain cables should have preferably one swivel in the middle of every alternate length, and one joining-shackle in each length. The stay-pins, to strengthen the links, are of cast-iron. The bar or rod from which each link is made has the two ends cut diagonally; it is bent into a nearly oval form; and then the two ends are joined and welded, the stay-pin being at the same time introduced at the proper place. Besides the ordinary links, there are end-links, joining-shackles, splicing-tails, mooring-swivels, and bending-swivels. The sizes of chain cables are denoted by the thickness of the rod-iron selected for the links. The following table gives certain ascertained quantities concerning the cables in ordinary use:

Thickness of Iron	Weight of Stay-pin.	Weight per Fathom.	Breaking Strain.
½ inch.	½ oz.	13½ lbs.	6 tons
1 "	3½ "	54 "	24 "
1½ "	12 "	121 "	60 "
2 "	28 "	215 "	99 "
2¼ "	40 "	272 "	126 "

Chain cables are made in links, the length of each being generally about 6 diameters of the iron of which it is made, and the breadth about 3½ diameters. There are two distinct kinds of chain cables—the stud-like chain, which has a tie or stud welded from side to side, and the short-link or unstudded chain. The cables for use in the mercantile service are made in 15-fathom lengths, but in government contracts chain cables are required to be made in 12½-fathom lengths, with one swivel in the middle of every alternate length, and one joining-shackle in each length.

Compared with the strength of hempen cable, a chain cable of one inch diameter of rod is equivalent to a hemp cable 10½ inches in circumference; 1¼ inches, to 13½ inches; 1½ inches, to 16 inches; 1¾ inches, to 18 inches; and 2 inches, to 24 inches. In navigation a cable's length is a nautical measure of distance equaling 120 fathoms, or 720 ft., by which the distances of ships in a fleet are frequently estimated. This term is often misunderstood. In all marine charts a cable is deemed 607.56 ft., or one-tenth of a sea mile. In rope-making the cable varies from 100 to 115 fathoms; cablet, 120 fathoms; hawser-laid, 130 fathoms, as determined by the British admiralty in 1830. According to Ure a cable's length is 100 to 140 fathoms in the merchant service. The wire rope used for submarine telegraphy is also called a cable.

Cables, Submarine, specially constructed ropes of wire, hemp and gutta percha or other waterproofing and protecting materials laid on ocean or river beds for the purpose of providing means of electrical communication

across large bodies of water. Until the discovery of gutta percha such communication was impossible, as water is so good a conductor of electricity that the submersion of current carrying wires was dependent upon complete insulation. In this gum, however, such a perfect insulator was found that submarine communication all over the world became merely a question of time, experience and necessity. In 1843 Prof. S. F. B. Morse suggested electrical communication between the United States and Great Britain, but it was not until more than twenty years had passed that practical telegraphy across the Atlantic Ocean was established. From that day to this the development of cable construction and communication has been one of the wonders of modern scientific achievement.

In 1852 Dover and Ostend were connected by cable. In 1854 Sweden and Denmark, Italy and Corsica, and Corsica and Sardinia were linked. In 1856 Cape Ray and Cape Breton, and Prince Edwards Island and New Brunswick were united. In 1857 and 1858 a cable 2,500 miles in length, weighing about a ton per mile, and costing $1,256,250, was successfully laid after repeated failure across the Atlantic Ocean. In the latter year, two more cables were laid connecting Great Britain with the Continent, one to Holland and one to Hanover; and 1859 saw England joined with Denmark and France, and Malta with Sicily. In 1860 France and Algiers were connected, and in 1861 Malta and Alexandria, Bavaria and Singapore. In 1866 another cable was successfully laid across the Atlantic by the Great Eastern after a failure to do so the year before, and then this vessel grappled the lost cable of 1865, recovered it from a depth of two miles, spliced it, and completed the task of landing the end at Heart's Content.

Periods of what might be called great cable laying booms have occurred since these early beginnings, both the Atlantic and Pacific Oceans being successfully traversed by cable-laying ships. At present there are practically, besides the French lines, but two competing companies in the North Atlantic field—the Anglo-American and the Commercial Cable Company. There are fifteen cables between North America and Europe, some of which run into New York harbor. The cables of 1858, 1865, and 1866 are "dead," and three others have but a brief tenure of life. Nine are "alive" and active. There are over 250,000 miles of submarine cables, enough to go about eight times around the globe. They have cost about $200,000,000; but their market value is considerably higher, as deep sea cables are solid and profitable investments. Improvements have been made from time to time in the construction of cables and cable instruments.

CABLE, George Washington, American novelist and miscellaneous writer: b. New Orleans, La., 1844, Oct. 12. His father died when he was 14 years of age, and he had to leave school and seek employment as a clerk

in order to support his mother and sisters. In 1863 he joined the Confederate army as soldier in a cavalry regiment, and served till the conclusion of the Civil War, when he returned to New Orleans and again took to commercial life. But in 1879, being by this time a practised writer, and having had considerable success with his literary ventures, he decided to devote himself entirely to authorship. In 1884 he took up his residence in Massachusetts, where he has originated a system of 'home culture clubs.' His first important book, *Old Creole Days* (1879), appeared originally in *Scribner's Magazine;* and since its publication he has written *The Grandissimes* (1880); *Madame Delphine* (1881); *The Creoles of Louisiana* (1884), a history; *Dr. Sevier* (1884); *The Silent South* (1885), a plea for the negro; *Bonaventure* (1888); *The Negro Question* (1888); *Strange True Stories of Louisiana* (1889); *John March* (1894); *Strong Hearts; The Cavalier* (1901); *Bylow Hill* (1902).

CABLEGRAM, n. *kā'bl-grăm* [Eng. *cable;* and Gr. *gramma,* a letter]: (colloq.) a message by means of electricity sent along a submarine telegraphic cable or wire.

CABOCHED, a. *kă-bŏsht'*, or CABOSSED, a. *kă-bŏst'* [F. *caboche,* head—from mid. L. *cabo*—from L. *caput,* head]: in *her.,* having the head of a beast with a full-faced view, and nothing of the neck seen.

CABOCLE, n. *kăb'ŏ-kl:* in *Brazil,* a compact brick-red mineral, resembling jasper.

CABOOK, n. *kă-bûk'* [native name for the *laterite* of India]: a brick-red clayey deposit prevailing over the greater part of India.

CABOOSE, n. *kă-bôs'*, or CAMBOOSE, *kăm-bôs'* [Dut. *kombuis* and *kabuis;* Dan. *kabys;* Sw. *kabysa,* a cook's room in a ship]: kitchen or cook-room in a merchant-ship; now usually called a *galley;* [U. S.]: a car for the crew of a freight railway-train.

CABOT, *kăb'ot,* GEORGE: b. Salem, Mass.: 1752, Dec. 3; d. Boston, 1823, April 18: shipmaster, afterward merchant. In the Massachusetts provincial assembly he resisted an attempt to fix a maximum price for provisions. He was a member of the state constitutional convention, and of that which ratified the federal constitution; U. S. senator 1790–96; a federalist and friend of Washington and Hamilton. Appointed first sec. of the navy, 1798, May 3, he declined. He was a member of the Mass. Council, 1808, and pres. of the Hartford Convention, 1814. He died in Boston.

CABOT, *kâb'ot,* or GABOTTO, *gâ-bot'to,* GIOVANNI: Venetian navigator and discoverer: said by Harrisse (Monograph, Paris, 1884) to have been b at Genoa, and naturalized at Venice 1476: d. abt. 1500. His business compelled him to reside much in

Bristol, England; and he was appointed by Henry VII., 1496, Mar. 5, to the command of a squadron of five vessels on a voyage of discovery in the Atlantic. In this expedition he was accompanied by his sons Ludovico, Sebastiano, and Sanzio. The coast of Labrador was sighted, 1497, June 24. The merit of this discovery has been generally ascribed to the navigator's second son, Sebastian C., the most scientific of the family; but an extract from a chart preserved by Hakluyt mentions the father before the son. The expedition returned, 1497, Aug. In 1498, a second was made, with results unknown; and in 1499, a third to the Gulf of Mexico. About this time C. appears to have died.

CABOT, or GABOTTO, SEBASTIAN: navigator and discoverer: b. prob. 1477—d. prob. 1557; b. Bristol, England [Harrisse (Monograph) says Venice, but perhaps brought up at Bristol]; second son of Giovanni C. After three voyages with his father and brothers, nothing is heard of C. till 1512, when he entered the service of Ferdinand, King of Spain. During 1515 he was engaged in revising maps and charts, in connection with his profession, and in planning an exploration of the N. W. Passage to Asia, which, however, was laid aside on account of the death of Ferdinand, 1516. C., who seems to have been no favorite with the Spanish courtiers, was now subjected to a series of contemptible insults. This usage induced him to return to England, and in 1517 he was appointed by Henry VIII. to the command of an expedition to Labrador. He reached lat. 67½° n., and entered Hudson's Bay, where he gave names to several places; but the expedition proved on the whole a failure, through the cowardice or malice of his vice-commandant, Sir Thomas Perte. C. now entered again into the Spanish service, was made pilot-major of the kingdom by Charles V., and commanded an expedition which examined the coast of Brazil and La Plata, which he attempted to colonize. In 1531, he returned to Spain, and resumed his old situation; but, 1548, he once more betook himself to England, where he was well received by King Edward VI., who made him inspector of the navy, and gave him a pension. To this monarch he seems to have explained the variation of the magnetic needle in several places, which he was among the first, if not the very first, to notice particularly. In 1553, C. was the prime mover and director of the expedition of Merchant Adventurers which opened to England an important commerce with Russia. He seems to have died in London. See Biddle's Memoir (1831). Desimoni (in his work, 1881) asserts that Sebastian C. discovered the continent of America at least a year before Columbus saw it.

CABOTVILLE, Mass.: see CHICOPEE.

CABOTZ: see CUSSO.

CABRA, *kâ'brâ* (ancient *Ægabrum*): town of Spain, province of Cordova, 30 m. s.e. of the city of Cordova. Pop. 14,000.

CABRAL, *kâ-brâl'*, FRANCISCO: 1528–1609, Apr 16; b.

Covilhao, Portugal: Rom. Cath. missionary. He became a Jesuit, 1554; was sent to India and made prof. of philosophy and theology at Goa, and superior of the schools of his order; went eastward; made many converts in Japan, and directed the missions in China; returned to Goa, and controlled the Rom. Cath. schools there for 38 years. He had great zeal and devotedness in his work. His letters are preserved in the Jesuit *Literæ Annuæ*.

CABRAL, *kâ-brâl'* or CABRERA, *kâ-brā'râ*, PEDRO ALVAREZ: discoverer of Brazil, 1500, Apr. 24: descended from an old patrician Portuguese family. After the first voyage of Vasco de Gama, the king appointed C. to the command of a fleet of 13 vessels, carrying 1,200 men, and bound for the East Indies. He sailed from Lisbon, 1500, Mar. 9. To avoid the inconvenience of being becalmed on the coast of Africa, he took a course too far westerly, fell into the S. American current of the Atlantic, and was carried to the unknown coast of Brazil, of which he claimed possession for the king of Portugal, 1500, Apr. 24, naming the new country 'Terra da Santa Cruz.' After sending home one vessel to bear news of this great accidental discovery, C. sailed for India; but on May 29, four of his vessels foundered, and all on board perished, including Diaz, the great navigator; and soon afterward three more vessels were lost. C. therefore landed at Mozambique, on the e. coast of Africa, of which he first gave clear information, and also discovered (Aug. 23) the Antschedives Islands, whose position he described correctly. Hence he sailed to *Calicut*, where, having made the terror of his arms felt, he was permitted to found a factory; entered into successful negotiations with native rulers, and thus established the first commercial treaty between Portugal and India. He returned from India, bringing with him considerable booty, and arrived in the port of Lisbon, 1501, July 31. It appears probable that the king was dissatisfied with the results of the expedition (although it had annexed Brazil to the crown of Portugal), for subsequently no mention is recorded of C. among other discoverers. At the request of C., Sancho de Toar wrote a description of the coast of Sofola. C.'s voyages are described in Ramusio's *Navigatione e Viaggi*, 3 vols. (Venice, 1563; new ed., Venice, 1835).

CABRERA, *kâ-brā'râ:* small island in the Mediterranean, off the s. point of Majorca. It is about 3 m. in length and breadth, with an irregular coast, and is little else than a barren calcareous rock. The only interest attached to C. is that during the war in the Peninsula it formed a Spanish depot for French prisoners, who were crowded in thousands into the desolate spot, and treated with great barbarity; of which an account is given in a popular work, entitled the *Adventures of a French Sergeant*.

CABRE'RA, Don RAMON: 1810, Aug. 31—1877, May 24; b. Tortosa, in Catalonia: boldest leader of the Carlist party in Spain. The death of Ferdinand, 1833, gave the

signal for a civil war, and brought C. into notice. Placing himself at the head of some guerilla troops, he joined the Absolutists, or partisans of Don Carlos, and by his vigilance, energy, and daring soon rose to be second in command in the Maestrazgo district. Throughout Aragon and Valencia his name became a by-word for cruelty. After penetrating as far s. as Andalusia, his forces were completely routed by the royal troops, on the borders of Aragon, and he, severely wounded, escaped with difficulty into the woods. It was now rumored that C. was dead, when suddenly he reappeared at the head of 10,000 foot and 1,600 horse. Invading the province of Valencia, he overthrew the royal army at Buñol, 1837, Feb. 18, and again, Mar. 19, at Burjasot; but was vanquished at Torre-Blanca, and once more compelled to seek a hiding-place. Shortly afterward he reopened the war with fiery energy. Madrid itself was threatened by C., who, about this time, received the title of Count of Morella for his vigorous defense of the fortress of that name, and was also appointed gov.gen. of Aragon, Valencia, and Murcia. The Carlists now believed that the triumph of absolutism was approaching, when the treachery of the Carlist general, Marotto, changed the whole aspect of affairs, and Don Carlos fled from Spain. C. held out until Espartero forced him to quit the country in the summer of 1840. He then entered France, where he was taken prisoner, and confined for a short time in the fortress of Ham. In 1845, he strongly opposed Don Carlos's abdication of his rights. On the outbreak of the French revolution, 1848, he renewed the struggle on behalf of absolutism in Spain; but his adventure failed miserably, and he recrossed the Pyrenees, 1849, Jan. 17, to live in retirement. He afterward married a wealthy English lady, Marianne Catherine Richards. When Alphonso was proclaimed king of Spain, 1875, C. advised the Carlists to submit to him, chiefly because he was 'a good son of the church.'

CABRIOLET, n. *kăb′rĭ-ō-lā′* [F. *cabriolet*—from *cabriole*, a goat-leap, a caper]: a one horse coach with a hood and a cover for the legs; a cab.

CABUL, *kâ-bôl′*: that part of Afghanistan (q.v.) s. of the Hindu Kush; drained by the Cabul river. It extends from the s. of Ghiznee to the Hindu Kush, and from Bamian (q.v.) to the Khyber Pass. This region has long held the attention of the world. Through it, as the passage from Persia to India, Alexander the Great marched to complete his eastern conquests; from it issued Mahmoud of Ghiznee, the first Mohammedan invader of Hindustan.

CABUL (called in England *Caboo′l*, but by Anglo-Indians *Cau′bul*): city, cap. of Afghanistan; lat. 34° 30′ n., long. 69° 6′ e.; near the point where the C. river, here crossed by three bridges, ceases to be fordable. Elevated about 6,400 ft., and overtopped, within a short distance to the n., by pinnacles of the Hindu Kush, about 14,000 ft. higher than itself, C. has a severe winter, and a temperate summer, ranging from 75° to 85° F. The city was formerly surrounded

with an earthen wall, which no longer stands. It is separated into different quarters, for defense, by stone walls —the Bala Hissar, or citadel proper, being on the e., and the Kuzzilbashes, or Persians, having a strongly fortified quarter on the s.w. In the days of Sultan Baber, C. was the capital of the Mogul empire. In more recent times, it has witnessed some of the most momentous events in Anglo-Indian history. In 1839, it was taken by the British; in 1841, it was lost through a treacherous outbreak, which led (1842, Jan. 6) to the massacre of about 4,000 soldiers and 12,000 followers; and, finally, after being recovered by General Pollock in the same year, it was abandoned, its bazaars and public buildings having previously been burned to the ground.

After the death of Dost Mohammed, Ameer of Afghanistan, 1863, Shere Ali, the son whom he had selected as his heir, had to fight for the possession of C. with Afzul Khan, his elder brother, and the son of the latter, Abdulrahman. In 1866, Afzul entered C. in triumph, and was proclaimed Ameer of Afghanistan. He applied to the Indian viceroy for recognition, but the request was declined. At the death of Afzul, his brother Azim took the title of Ameer, not of Afghanistan, but of C. and Candahar. In the end of 1868, Shere Ali, aided by his son Yakoob, obtained possession of C., which became again the cap. of Afghanistan. War was declared against Shere Ali by England, 1878. In the treaty concluded, 1879, by Yakoob, then the ameer by the death of his father, it was agreed that an English resident should be admitted to C.; and, 1879, July, Sir Louis Cavagnari was established in the capital. But, in September, he, his suite, and escort were assassinated; war recommenced; and a month later C. was occupied by English troops, who remained there till 1880, Aug. Meanwhile Yakoob, a fugitive under English protection, had abdicated his sovereignty; and Abdulrahman (or Abdurrahman), son of Afzul, was recognized as ameer.

Pop. of the city of C., 60,000.

CABUL′: river in Afghanistan, rises lat. 34° 21′ n., long. 68° 20′ e., on the s. declivities of the Hindu Kush, or Indian Caucasus. Its source is 8,400 ft. above the sea; and an eastward run of 320 m., with a fall of about 7,500 ft., along n. Afghanistan, through the Khyber Mountains, and across Peshawur, carries it into the Indus, opposite to Attock, in the Punjab. The point of confluence marks the head of navigation on the main stream, while the tributary itself is navigable about 50 m. upward for craft of 40 or 50 tons. By means, therefore, of the two taken as one line, there is available communication of about 1,000 m. between the Khyber Mountains and the Indian Ocean. On the banks of the C. are the cities of Cabul, Jelalabad, and Dobundee.

CABURNS, n. *kā′bĕrnz:* small lines made of spun yarn to bind cables.

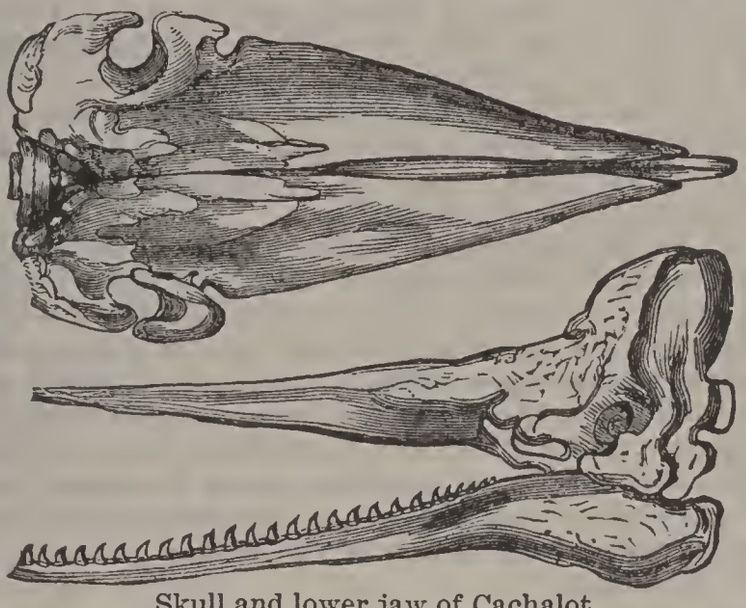
CACAINE, n. *kă-kā′ĭn:* the essential principle of cacao

CACHALOT, or CACHOLOT, n. *kăsh'ŭ-lŏt* [F. of Catalan origin: Dut. *kazilot:* Sw. *kaselot*]: the sperm or spermaceti whale (*Physeter macrocephalus* or *Catodon macrocephalus*); one of the largest of the *Cetacea* (q.v.), very peculiar in form and appearance, much sought after for the oil, but still more for the spermaceti (q.v.) which it yields. Ambergris (q.v.) also is obtained from it. The C. belongs to the family of *Cetacea* called *Physeteridæ*, or *Catodontidæ*, of which some naturalists still think that there is only one well-ascertained species. There appears, however, good reason for thinking that at least two species exist—the Common C., having no dorsal fin, and the High-finned C. (*Physeter Tursio*), having a very high dorsal fin. The Common C. has a very wide geographical range. It may be said to inhabit all seas, though most abundant in the southern hemisphere. It is not frequent on European shores, though it sometimes enters the Mediterranean, and is occasionally stranded on the coasts of Britain. The C.

Cachalot, or Sperm Whale.

sometimes reaches the length of 80 ft. The head is enormously large, forming about one half the entire bulk of the animal, and occupying more than one-third of the entire length. From the head, the body tapers to the tail, and at last rather rapidly. The general color is very dark gray, nearly black on the upper parts, lighter beneath. Old males, or, in the language of the South Sea whalers, old bull-wales, usually have a large gray spot on the front of the head. The muzzle is very obtuse, almost as if suddenly cut off in front, the breadth of it almost equalling the thickness of the body. In a protuberance on the upper part of it is the blow-hole, which is single, a little on the left side, and in form not unlike the letter S elongated. The mouth is very large and wide; and the throat, unlike that of the Greenland whale, is very wide, sufficiently so to admit the body of a man. The upper jaw projects some feet beyond the lower, and is destitute both of teeth and whalebone; the lower jaw has from 20 to 25 teeth on each side, according to the age of the animal. The teeth are conical and slightly recurved, projecting about two inches from the gum. The lower jaw is ex-

tremely narrow, the two branches being in contact throughout the greater part of its length: it fits into a groove in the upper, in which are cavities for the teeth. The eyes are small, and placed far back in the head, above the angles of the mouth; the left eye is said to be smaller than the right. Just above the eyes, the dorsal line rises considerably; the dorsal fin is also represented by a protuberance about half-way between the neck and the tail; and these parts are seen above water in the ordinary swimming of the animal, which is at the rate of from 3 to 7 m. an hour, and just under the surface of the water, although when alarmed it swims with greater velocity, striking the water upward and downward with its tail with great force. The pectoral fins are small, and seem scarcely, if at all, to aid in progression, which is accomplished by the large and powerful tail-fin. The tail-fin is



Skull and lower jaw of Cachalot.

very broad, and is divided into two lobes, called by whalers *the flukes*.

The enormous head of the C. is in great part occupied by a cavity in front of and above the skull, called by whalers *the case*, which is a receptacle for spermaceti (q.v.). This substance being light, it is not wonderful that the animal in swimming raises its head above the surface of the water, which it also often does even when at rest, 'like a black rock in the ocean.' The *case* frequently holds as much as ten large barrels of spermaceti. It is formed not of bone, but of a strong tendinous integument, and is divided into compartments communicating with each other. The substance which it contains is in a semi-fluid state, but hardens on cooling: it consists of spermaceti and oil; the oil is separated by draining and squeezing, and the spermaceti further purified, till, instead of being a yellow unctuous mass, in which state it is brought home by the whalers, it assumes a beautiful pearly white, flaky, almost crystalline appearance. When the spermaceti whale is killed, and towed alongside the whaling-ship, the *case* is emptied of its valuable contents through a hole

made in front of the muzzle, and by means of a bucket attached to a pole. The spermaceti was formerly imagined to be the brain of the whale; what purpose it serves in the animal economy is not well known, except that of giving buoyancy to the forepart of the huge body; and perhaps this is its chief use, respiration even more than progression depending on it; but it is distinct enough from the brain, which is comparatively very small, and is indeed, as well as the skull which contains it, small in proportion to the whole bulk of the creature. Cavities filled with spermaceti are distributed over the body, and even ramify through the external fat or blubber, although the principal mass is in the head. The blubber of the C. is not nearly equal in thickness to that of the Greenland whale, being only about 14 inches thick on the breast of a large whale, and 8–11 inches on other parts of the body. It is called by whalers the *blanket*, is removed from the body of the captured whale in great strips, and is heated in large pots, the skin of the whale serving for fuel, when the oil known as SPERM OIL (q.v.) flows from it. The *junk*, a thick elastic mass, which occupies the forepart of the head, immediately under the *case*, also yields considerable sperm oil.

The C. feeds upon fishes and cephalopodous mollusks. Squids and cuttle-fishes appear to be its chief food. It is gregarious, and the herds are called *schools* by whalers. Five hundred or more have been seen in a single herd. Large herds generally consist of females, with only a few males; herds of young males also occur; when solitary individuals are met with, they are almost always old males. Terrible conflicts often take place among the males, and it is not unusual to find the lower jaw deformed in consequence of having been dislocated or broken in them. See WHALE-FISHERY.

CACHAO, *kâtch-â'o*, or KESHO (also HANOI): ancient capital of Tonquin (see COCHIN-CHINA), on the Song-Ka or Red river, chief river of Tonquin, which rises in Yunnan. C. is on a plateau above the top of the Song-Ka delta, abt. 100 m. from the sea, and is accessible to vessels drawing from 4 to 6 ft. of water. Hanoi, the present capital of the province, is close to C., and may be considered practically one city with it. C. is a town of some 100,000 inhabitants, much the largest in this state, and has a citadel.

There is considerable trade. Exports are bullion, silks, and lacquered ware; imports are pepper, arms, chintzes, and manufactured goods generally.

Other towns are, Namdinh, an agricultural centre with 40,000 inhabitants; Haiphong, important treaty port at the mouth of the Song-Ka; Sontay and Bacninh, on the edge of the delta and the plateau, which are of strategical value.

CACHAR, *kâ-châr'*, or HAIRUM'BO: district of British India, since 1874 included in the chief-commissionership of Assam. It comprises 3,570 sq. m. It is mostly mountainous and uncultivated. Its principal river is the Barak,

which, after a singularly tortuous course of 350 m., enters the Brahmaputra, about 40 m. above Dacca. The territory produces rice, cotton, tea, sugar, timber, bamboo, iron-ore, wax, and ivory; and imports salt, cloths, tobacco, and ghee or half-liquid butter. Pop. (1891) 386,483.

CACHE, n. *kăsh* [F. *cache,* a lurking-hole—from *cacher,* to press under foot, to conceal—from mid. L. *coactārĕ,* to press together]: a secret store or deposit of supplies, as of food: name first applied by parties of travellers in the unsettled portions of the United States and Canada to places for concealing provisions and other articles. Designing to return on their tracks after crossing the Rocky Mountains, or after other journeyings, they disburden themselves of what articles can be spared, and to conceal them from the Indians, or from wild animals, construct places of deposit in the wilderness. The making of a C. is a matter of much labor and ingenuity. A hole is dug to a depth of 6 or 8 ft. and several feet broad, and then the articles being interred, the surface is replaced with the utmost possible care. The excavated earth is also carefully removed, so as to leave no trace of the excavation. The situation of the C., however, is known to the party by some landmark, and returning months afterward, they find its contents undisturbed. Similar deposits have been a frequent expedient with Arctic explorers, for preserving food for themselves, or for other parties.

CACHECTIC, a. *kă-kĕk′tĭk,* or CACHEC′TICAL, a. *-tĭ-kăl* [Gr. *kakos,* bad; *(h)exis,* habit]: pertaining to a vitiated or deranged state of the body called CACHEX′IA (q.v.), n. *ka-kĕk′sĭ-a,* or CACHEX′Y, n. *-sĭ.*

CACHEO, *kâ-shā′o,* or CACHAO, *ka-shâ′o,* or CACHEU, *kâ-shā′ó:* town of Senegambia, in the land of the Papels, a few miles inland from the mouth of the river Cacheo or St. Domingo, between the Gambia and Rio Grande; lat. 12° 6′ n., long. 14° 55′ w. It is a fortified post of the Portuguese, with a trade in gold-dust and ivory, as formerly in slaves. Pop. 15,000.

CACHET, n. *kăsh′ā* [F. *cachet,* a seal—from *cacher,* to conceal]: a seal, as of a letter; a mark or character. LETTRE-DE CACHET, n. *lĕt′r-dĕ-kăsh′ā* [F. letter-of-seal, or sealed-letter]: in *French history,* an arbitrary warrant of banishment or imprisonment, formerly issued in the form of a letter, by the kings of France: see LETTRES-DE-CACHET.

CACHEXIA, *ka-kĕk′sĭ-a:* a name applied sometimes to a group of diseases, sometimes to the constitutional state accompanying a particular disease—e.g., Cancerous C., Gouty C., Mercurial C. From Cullen's having in modern times given extensive circulation to the word, as indicating a large group of chronic diseases, in most of which there are complicated changes in the blood and in the solid textures, C. has come to be applied chiefly to diseases in which the general nutrition of the body is at fault, and in which the local disorders are supposed to be the result of a constitutional cause. Thus, Cancerous C. indicates the peculiar impoverished state of the blood and general de

bility associated with the deposits of cancer in various parts of the body; Gouty C., the state of the general system in gout, as opposed to the mere local attack in the foot, etc. The cachexiæ differ from the fevers in being much slower in development, and, for the most part, in having no natural termination at a fixed period: see CRISIS.

CACHICAMA, or TATOU-PERA *(Dasypus novem-cinctus):* species of Armadillo (q.v.), abt. 15 inches long; harmless. It feeds on insects. It is a S. American animal.

CACHINNATION, n. *kăk'ĭn-nā'shŭn* [L. *cachinnārĕ,* to laugh aloud]: loud or immoderate laughter. CACHINNATORY, a. *kă-kĭn'nā-tĕr-ĭ,* laughing immoderately.

CACHOU, *kăsh-ô',* CACHOUS, n. plu. *kăsh-ôz'* [F. *cachou,* a kind of rosin]: a pharmaceutical term for an extract prepared from the *Mimōsă cătĕchu,* ord. *Leguminōsæ;* an extract used to sweeten the breath.

CACHUCA, n. *ka-chū'ka* [Sp.]: an Andalusian dance, closely resembling the Bolero; the music for the same, in ¾ time.

CACHUNDE, n. *ka-chôn'dā* [Sp.]: a pastile or troche, composed of various aromatic and other ingredients, highly celebrated in India or China as an antidote, and as stomachic and anti-spasmodic.

CACIQUE, n. *kă-sēk',* or CAZIQUE *-zēk'* [Sp., from the language of the former inhabitants of San Domingo]: a petty king, particularly of ancient Mexico.

CACK, *kăk* [Dan. *kakke;* Dut. *kakken;* Ger. *kacken,* to cack—from L. *cacārĕ,* to go to stool]: to go to stool; to ease the body by stool. CACK'ING, imp. CACKED, pp. *kăkt.*

CACKEREL, n. *kăk'ĕr-ĕl* [Eng. *cack; -er;* dim. suffix *-el*]: a fish which, when eaten, produces laxity of the bowels.

CACKLE, v. *kăk'kl* [an imitative word: Sw. *kakla;* F. *caqueter,* to chatter: Dut. *kaeekelen;* Turk. *kakulla,* to cackle]: to make a noise like a hen; to make a silly noise; to giggle: N. the noise of a hen; idle talk. CAC'KLING, imp.: N. the noise of a hen. CACKLED, pp. *kăk'kld.* CAC'KLER, n. *-klĕr,* one who.

CACODEMONIA, n. *kăk-ō-dē'mō-nĭ-â* [Gr. *kakos,* bad, *chumos,* juice]: a diseased condition of the humors resulting from any cause. CACOCHYMICAL, a. *kăk'ō-kĭm'ĭ-kăl,* and CAC'OCHM'IC, a. *-ĭk,* having the humors in a depraved state.

CACODEMONIA, n. *kăk-ō-dē'mō-nĭ-â* [Gr. *kakos,* bad, and *daimon,* evil spirit]: A form of insanity in which the patient supposes himself to be under the influence of an evil spirit. See DEMON.

CACODYLE, or KAKODYLE, n. *kăk'ō-dĭl* [Gr. *kakos,* bad; *ozō,* I smell; *ūlē,* matter]: terribly poisonous com-

pound, containing carbon, hydrogen, and arsenic (C_4H_6As). It has been proposed to employ the oxide of cacodyle (C_4H_6AsO) as a deadly agent in war. This compound, otherwise known as *Cadet's fuming liquor*, or *alkarsine*, called also *arsendim'ethyl*, has the remarkable property of taking fire spontaneously when exposed to the air, and evolving abundant fumes of arsenic. Thus a shell filled with it would, on bursting, saturate a space of ground, or the rigging or deck of a man-of-war, with a liquid which would quickly take fire of its own accord, and besides causing destruction by burning would likewise spread death by its fumes. Cacodylic acid, a compound of cacodyle, is not poisonous.

CACOETHES, n. *kăk'o-ē'thēz* [Gr. *kakos*, bad; *ēthos*, custom, habit] bad custom or habit, generally applied to inveterate scribblers. *Cacoethes scribendi, c. loquendi*, a passion for scribbling, for talking.

CACOGRAPHY, n. *kă-kŏg'ră-fĭ* [Gr. *kakos*, bad; *grapho*, I write]: bad spelling.

CACOLOGY, n. *kă-kŏl'ŏ-jĭ* [Gr. *kakos*, bad; *logos*, a word]; bad grammar or speaking.

CACONGO, *kâ-kong'go*, or MALLEM'BA; independent state of S. Guinea, Africa, extending along the s. Atlantic Ocean; lat. 5° s., and stretching s.e. as far as the river Bell. Its limits interiorly are not well defined. The country is generally flat, and the soil fertile. The principal towns are Kinguele, and Cacongo and Mallemba on the coast, the last formerly a great mart for slaves.

CACOPHONY, n. *kă-kŏf'ŏ-nĭ* [Gr. *kakos*, bad; *phōnē*, a voice]: disagreeable or harsh sounds of words; discord. CACOPH'ONOUS, a. *-ŏ-nŭs*, and CAC'OPHON'IC, a. *-ō-fŏn'ĭk*, harsh-sounding.

CACOTECHNY, n. *kăk'ō-tĕk-nĭ* [Gr. *kakos*, bad; *technia*, art]: a bad or depraved or state style of art.

CACOTROPHY, n. *kăk-ŏt'ră-fĭ* [Gr. *trophia*, nutrition]: bad or defective nutrition.

CACTEÆ, *kăk'tē-ē* or CACTACEÆ, *kăk-tā'sē-ē:* nat. ord. of exogenous plants, consisting of succulent shrubs and herbs of very singular appearance. Linnæus included all the Cacteæ in the single genus *Cactus*, which is now divided into a number of genera; the name *Cactus*, however, still continuing in popular use, common to the whole order. Nearly 500 species are known; the real number is probably much greater. The Cacteæ are, without exception, natives of America, and their extraordinary forms constitute a remarkable feature in the vegetation of its warmer regions and especially of the arid deserts of the Southwest and Mexico. All of them have fleshy stems, either simple or branched, often very soft and juicy; but in many, at least when old, having an easily distinguished woody and hollow

axis forming a lace like skeleton which forms the support for the fleshy pulp that surrounds and covers it. The thick green skin performs the double function of skin and leaves. Most of them are leafless; the *Pereskiæ* alone have true leaves, which are fleshy; and the *Opuntiæ* have rudimentary leaves, which soon fall off; most of the order have clusters of hairs or prickles, where buds are formed in their stems, and these are very numerous, even in the species which in ordinary circumstances most rarely develop branches. The multiplicity of curious forms exceeds imagination; in many species (*Melocactidæ*, or Melon Thistles) the stem swells out into a globe; in others (*Torch Thistles*) it rises up as a column with many angles; in others (*Opuniæ*, Indian Figs, or Prickly Pears) it divides in leaf-like articulations; in some (*Pereskiæ*) it assumes a tree-like form, in which the thick stem bears a head of branches, and reaches a considerable height, sometimes even 30 or 40 ft. Those which have angular, ribbed and channeled, or flat and two-edged stems show a tendency to the cylindrical form as the stem advances in age. Some species have long creeping or trailing stems. The whole organization of the Cacteæ adapts them for the endurance of long droughts; they vegetate vigorously during a part of the year, and then rest; the very absence of leaves concurring with the absence of pores or *stomata* in their tough skin to enable them to resist the action of a dry atmosphere and powerful sunshine, and to occupy arid soils and bare rocks, on which they are often found covering large tracts. Some of them grow rapidly on old lavas, and disintegrate them by their penetrating roots, thus preparing a soil for other plants; and the Prickly Pear is often planted in Sicily by the mere insertion of a branch or joint of it in a fissure of lava. Many species occur as *spiphytes* (q.v.) on the trees of American forests in the tropics.

Some also grow on high mountains, a few even reaching almost to the border of the snow. The plants of this order are a boon to the regions in which they chiefly abound, which are during great parts of the year liable to be destitute of water—their stems containing a small store of insipid and wholesome juice, of which both men and cattle avail themselves when hard pressed for water. Some species of the Prickly Pear (q.v.), produce a pleasant fruit. The fruit of *Opuntia Tuna* affords a valuable pigment of the richest carmine color. The cochineal color, one of the most intense reds, so much used in chemistry and the arts, comes from the bodies of the cochineal bug that lives on the *Opuntia cochinellifera* of Mexico which is one of the so-called flat-leaved prickly pears like the *Tuna*. The flat *Opuntias* have red pear like fruits filled with many seeds and a red or purple pulp that is pleasantly acid and a real boon in the deserts where the soil and water

are always alkaline. The fruits are universally eaten by birds and man. Some of the fruits are as large as a small pear and some are free from prickles, like the *Tuna*. The flat branches or so-called leaves are often fed to stock in times of scarcity of feed by picking them and burning off the prickles. Cattle will at rare intervals attack them without this treatment when starving but the torture they endure from the myriad needles is painful to see. The fearful prickles and spines of the *Cactaceæ* alone prevent their extermination.

The *round stemmed Opuntias* form the well known Codies bushes of the deserts of the Southwest which often form dense clumps with their many branching stems and are impenetrable, their sheathed spines inflict frightful punishment on the unwary animal that touches them as the sheaths come off the spines and stick the flesh like the barbs of hedgehogs. The Choia *Opuntia Emoryi* is the worst of these, for the joints of the stems themselves come at the slightest touch and the rosettes of spines keep sticking into the animal at every motion till the whole side of a joint has its murderous spines imbedded in the flesh. These bushes form a safe retreat beneath them for the small animals of the desert against their larger enemies. The mocking bird builds its nest secure among its branches though only a few feet above the ground. The bush Opuntias do not grow north of Pueblo, Colorado, central Utah and southern Nevada, nor do they grow in humid hot regions, but they abound on the deserts of Texas to California and thence southward in Mexico. They are often planted for hedges. Their fruits are valueless. The flat *Opuntias* occur even in British America but are low and insignificant there and in the North.

Some of the flowers of the Cacteæ are very short-lived; those of some night-flowering species, as of *Cereus grandiflorus*, well known in hot-houses, endure only for part of a single night. In the greater number they are large and splendidly colored, in some they are very fragrant. The order is regarded as botanically allied to *Mesembryaceæ* (q.v.) and to *Grossulariaceæ* (q.v., Gooseberry, Currant, etc.).

The cultivation of the Cactus in green-houses and hothouses has been much in fashion for more than 30 years. The gardener must imitate the natural conditions of their growth, by giving water freely during a few months, and withholding it almost entirely during the rest of the year. Most of them are easily propagated by branches, taken off, and allowed to dry a little before being planted. The *Melocactidæ*, which do not readily produce branches, are made to do so by cutting off or burning out the central bud, that the means of propagating them may be obtained.

The *barrel cactus*, *Echino cactus* is another large genus of this family whose stems often grow singly

like a barrel standing on end and occasionally as large, sometimes reaching the height of a man. They have many rows of long and stiff cross-ribbed spines which are often hooked at the end. Travelers occasionally when hard pressed for water, cut out the green top leaving a small cavity where a bitter water slowly collects with which they slake their thirst. A few species produce an acid fruit. The *bushel cactus*, several species of *Cereus*, so named because they grow in dense clumps shaped like an inverted bushel basket, with many stem pear-like or potato-shaped, all connected at the base, abounds on rocks and the species with blood red flowers are very showy. The *giant cactus*, *Cereus giganteus* and others sometimes grow fifty feet high and with two or three branches above the middle, much like tines of a fork. These form a very peculiar and weird flora as though the deserts were peopled with sentinels, as they look much like men standing, when unbranched, though they are taller and wider but cylindrical. They abound south of the Colorado river in Arizona and adjacent Mexico. They harbor multitudes of owls and flickers which nest in the stems by picking holes in them. The *petaias* are closely allied to the giant cactuses but differ in the fewer ribs and deep angles of the stems and the candelabrum-like branches. They abound in Mexico and are much used for hedges and fences. One species has a delicious smooth fruit which is quite an article of internal commerce in Mexico.

The flowers of many *Cactaceæ* such as *Opuntia rutila*, *Cereus Engelmanni*, most of the *Mamillarias*, and others are the most beautifully tinted and shaded of any flowers known, and many are magnificent. The spines of the *Cactaceæ* are the most terrible weapon of defense known in the vegetable world.

CACTUS, n. *kăk'tŭs*, CACTI, plu. *kăk'tī* [L. *cactus*, a prickly plant]: a genus of tropical plants with fleshy prickly stems and leaves—a name loosely applied; a genus of flowering plants; the Indian fig tribe; the melon-thistle: see CACTEÆ. CACTACEOUS, a. *kăk-tā'-shŭs*, pertaining to the *Cacteæ* or *Cactaceæ*.

CACUMINATE, v. *ka-kū'mĭn-āt* [L. *cacumino*—from *căcū'mĕn*, an apex]: to reduce to a point or an apex.

CACUS, *kā'kŭs:* a man eating giant of mythology, son of Vulcan and Medusa, who lived in a cave on Mt. Aventine, in Italy, robbed the adjacent country, and vomited fire and smoke. He stole some of Geryon's cows from Hercules, and dragged them into his cave by their tails, that they might not be tracked by their foot-prints. Hercules, discovering the theft, strangled him, and erected an altar to Jupiter Servator. An annual festival was kept by the people of those parts to commemorate their deliverance.

CAD, n. *kăd* [Scot. *cad* or *caddie*, one who gains a

FLOWER OF THE HEDGEHOG CACTUS.

livelihood by running errands: Gael. *cad,* a friend; may also be a familiar corruption of Eng. *cadet* (see CADET and CADGE)]: an omnibus conductor; a hanger-on about railways or stage-coaches; an errand-boy; a person employed under another in job-work; one who would do a mean or base action; a snob or vulgar person. CADDISH, *kăd'ĭsh,* vulgar; mean. CAD'DISHNESS, n. snobbishness; mean vulgarity.

CADAMBA, *ka-dăm'ba,* or KUDUMBA: wood of several species of *Nauclea,* a genus of trees of the nat. ord. *Cinchonaceæ,* natives of the East Indies, having flowers with a funnel-shaped corolla. *N. cadamba* is a noble tree, with orange-colored fragrant flowers, collected in heads about the size of a small apple. The leaves are 6–10 inches long. The wood is yellow, soft, and fine-grained. The tree is highly prized for shade; the wood is used for various purposes. *N. cordifolia* is a large tree, plentiful in mountainous districts of Hindustan; the wood yellow, close-grained, used for flooring-planks, packing-boxes, and many other purposes, as is also that of N. *parviflora.* All kinds of Cadamba wood are liable to be injured by moisture, and can be used only where they are to be kept dry.

CADASTRE, n. *kă-dăs'tĕr* [F. *cadastre;* OF. *capdastre,* an official report on real property—from mid. L. *capĭtas'trum,* a register for taxation—from *caput,* the head, the capital sum of a contribution]: a statistical account; an outline descriptive map, showing the different properties of a district, such as may be taken in the government survey. CADASTRAL, a. *kă-dăs'trăl,* descriptive; showing the different properties of a district and giving other statistical information; showing the true relative position and size of objects on the surface of the country: a usual scale for a cadastral map is 2 ft. to a mile.

CADAVER, n. *ka-dā'vĕr* [L. *cadaver*—from *cado,* I fall]: a corpse; a carcass. CADAV'EROUS, a. *-ŭs,* or CADAV'ERIC, a. *-ĭk,* resembling or pertaining to a corpse; pale; wan; ghastly. CADAV'EROUSLY, ad. *-lĭ.* CADAV'EROUSNESS, n.

CADDICE, or CADDIS, n. *kăd'dĭs,* or CADDICE-FLY [corruption of *cod-bait;* Ger. *köder,* bait], (*Phryganea*). Linnæan genus of insects of the ord. *Neuroptera,* a family in subsequent entomological systems, and constituted by Kirby into a distinct order, *Trichoptera* [Gr. hairy-winged]. The caddis-flies certainly differ in important particulars from the other neuropterous insects, and have points of resemblance to the *Lepidoptera.* They have no mandibles, and the maxillæ and lower lip are membranous and united, the head is small, with prominent eyes, and two additional small simple eyes situated on the forehead,

the antennæ are long and bristle-like, composed of very numerous indistinct joints. Both wings and body are generally very hairy, and the wings, when at rest, are raised, and meet above the back like those of butterflies, from which, however, they differ very much in form, being much more elongate: the legs are long. Caddice-flies are extremely active, particularly in the evening and night, when the smaller species often fly in great numbers above streams and ponds. These insects are most interesting, however, on account of their larvæ, of which the larger kinds are the well-known *Caddis-worms*, or *Cad-bait* of anglers. They are of a long, almost cylindrical form, the head and first three segments hard, the remainder—the abdominal segments—soft. To the thoracic segments are attached the feet, six in number, as in the perfect insect. The larva lives always in water, feeding on aquatic vegetables. It spins by its mouth silken threads, by means of which, together with a viscid substance, it attaches together—and often in a very symmetrical manner, and with interesting peculiarities which differ in the different species—small hard substances, such as small stones, bits of stick, or small shells, even though they happen to contain living inmates, and thus constructs a case for itself, in which its soft body is protected, and from which only the head and hard thoracic segments are voluntarily protruded. When it changes into the pupa state, in which it differs little from the perfect insect, except in the imperfectly developed wings, it fixes its case to some solid substance beneath the water, and closes the two extremities with a kind of grating, which admits the free passage of water, necessary for respiration. Before assuming the perfect form, the pupa of the larger species breaks out of its case by means of a pair of hooks on the forepart of the head, and swims actively by means of the hind legs, or crawls by the other two pair. Many of the smaller species bring their pupa case to the surface of the water, and there take wing from it as from a boat. The species of Caddis-fly are very numerous, and they are said to be more so in the n. than in the s. of Europe. About 200 British species have been described.—The angler looks for cad-bait about the edges of streams and under stones, or on the stalks of water-cresses and other aquatic plants. As a bait for angling, the Caddis-fly is almost as deadly as the May-fly.

CADDIE, n. *kăd'ĭ* [Scot.]: an errand boy; in the game of golf, the lad who carries the clubs of the players.

CADDIS, n. *kăd'dĭs* [Scot. *caddis*, lint for dressing a wound. Gael. *cadas*, cotton; F. *cadis*, a sort of serge]: lint for dressing wounds; a kind of worsted lace or ribbon.

CADDY, n. *kăd'dĭ*, CADDIES, plu. *kăd'dĭz* [Chin. *catty*, the weight of the small packets in which tea is made up; Malay, *kati*, a weight of 1⅓ lb.]: a small box for tea.

CADE, n. *kād* [Icel. *kâd*, infant: Dan. *kaad*, frolicsome: Gael. *ceadach*, forward]: a forward and troublesome creature; a pet lamb; a lamb brought up by the hand; an unduly indulged or petted child.

CADE, n. *kād* [L. *cadus*, a bottle: Russ. *kade*, a cask]: a barrel; a cask.

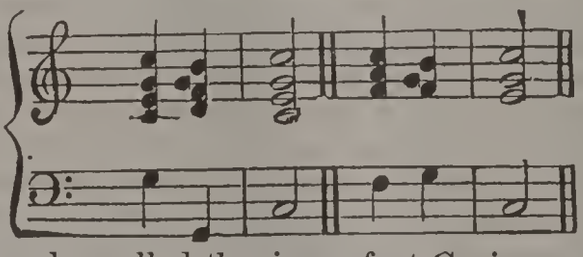
CADE, *kād*, JACK: d. 1450, July 11: leader of an insurrection which broke out in Kent, England, in the month preceding his death. Little is known of his personal history, further than that he was an Irishman, and an illegitimate relation of the Duke of York, and hence called himself Mortimer. With 15,000 or 20,000 armed men of Kent, Cade marched on London, and encamped at Blackheath, whence he kept up a correspondence with the citizens, many of whom were favorable to his enterprise. The court sent to him to enquire why the good men of Kent had left their homes; Cade, in a paper entitled 'The Complaint of the Commons of Kent,' replied that the people were robbed of their goods for the king's use; that mean and corrupt persons, who plundered and oppressed the commons, filled the high offices at court; that it was 'noised that the king's lands in France had been aliened'; that misgovernment had banished justice and prosperity from the land; and that the men of Kent were especially illtreated and overtaxed, and that the free election of knights of their shire had been hindered. In another paper, called 'The Request by the Captain of the Great Assembly in Kent,' Cade demanded that the king should resume the grants of the crown, which he complained the creatures about the royal person fattened on, the king thus being compelled to live on taxation; that the false progeny of the Duke of Suffolk should be dismissed; and that the Duke of York and others should be restored to favor, and a number of persons punished. The court sent its answer in the form of an army, before which Cade retreated to Sevenoaks, where he awaited the attack of a detachment, which he defeated. The royal army now objected to fight against their countrymen; the court made some concessions, and Cade entered London, July 3. For two days he maintained the strictest order; but he forced the mayor and judges to pass judgment upon Lord Say, one of the king's hated favorites, whose head Cade's men immediately cut off in Cheapside. On the third day some houses were plundered, the leader himself, it is said, setting the example. A promise of pardon now sowed dissention among his followers, who dispersed, and a price was set upon Cade's head. He at-

tempted to reach the Sussex coast, but was followed by an esquire, named Alexander Iden, who fought and killed him. His head was stuck upon London Bridge as a terror to traitors.

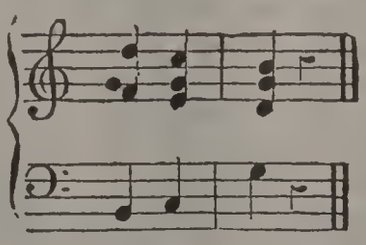
CADELLE, *kă-dĕl'* [F.], (*Trogosita Mauritanica* or *caraboides*): insects sometimes found in granaries in Britain, but seemingly imported from more southerly countries, where, as in France, its larvæ often commit great ravages among stored corn. They feed also on bread, almonds, and even rotten wood. When full grown, they are about three-quarters of an inch long, flattened, fleshy, rough with scattered hairs, whitish, tapering toward the head; which is black, horny, and furnished with two curved jaws. The perfect insect is a glossy beetle of a deep chestnut color, marked with dotted lines. It belongs to the family of *Xylophagi*, of the order *Coleoptera* (q.v.), section *Tetramera*.

CADENCE, n. *kā'dĕns* [F. *cadence*—from It. *cadenza*, cadence, measure—from L. *cadens*, a falling]: a fall; a decline; the modulation of the tones of the voice in reading; tone; sound; the manner of ending a piece of music: V. to regulate by musical measure. CA'DENCED, pp. *-dĕnst:* ADJ. regulated by modulation of the voice, or by musical measure. CADENZA, n. *kă-dĕn'zä* [It.]: modulation of the voice in singing; ornamental succession of notes introduced at the pleasure of the performer in finishing a phrase.

CA'DENCE, in Music: the finish of a phrase (in German, *Schluszfall*), of which there are three principal species—viz., the whole, the half, and the interrupted cadence. The whole C., which finishes on the harmony of the tonic, is also called the perfect C., and is always used at the end of a composition, and frequently called the final cadence. In its most perfect use it consists of three chords—the one before the final being always the dominant, as for example:

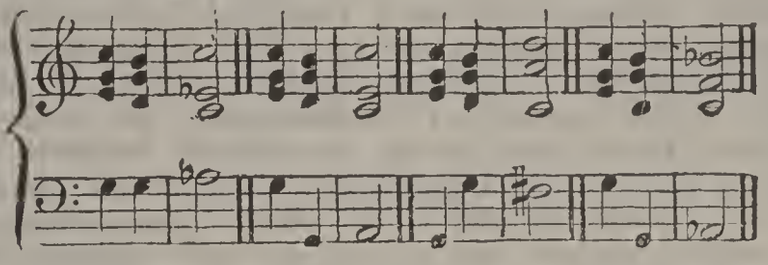


The half C., also called the imperfect C., is used to mark the termination of an idea or phrase, like the colon and semicolon; showing a considerable division, but at the same time that a continuation is necessary. The harmony of the half C. is the reverse of the whole C., as it falls from the tonic to the dominant, and sometimes to the subdominant, as follows:



In the interrupted C. (Ger. *Trugschlusz;* Ital. *Cadenza*

d' inganno), the preparation for the ordinary perfect C. is made; but instead of the harmony of the tonic following the dominant, another harmony quite strange is introduced, so that the ear is deceived. The more particular the preparation for the usual C. is made, the more strange and unexpected is the interruption, which can be made in so many ways that Reicha, in his *Traité de Haute Composition Musicale*, gives 129 interrupted cadences. The following are those generally in use:



CADENCY, n. *kā'dĕn-sĭ* [L. *cadens*, falling]: in *her.*, the system of distinguishing the several sons in a family by special bearings, as they fall or branch off from the stock. No distinction is usually made by writers on heraldry, and probably the practice of heralds in general scarcely admits of any being made, between *marks of C.*, *differences*, *distinctions*, or even *brisures*, though the last term is frequently, and quite appropriately, used to include not only differences

Distinction of Houses:

In the First House, the first, second, etc., sons are denoted by 1, the label; 2, the crescent; 3, the mullet; 4, the martlet; 5, the annulet; 6, the fleur-de-lis; 7, the rose (not figured in the cut); 8, the cross moline; 9, the double quatrefoil. In the Second House, or family of the second son, the first son is denoted by (1) the crescent, with the label upon it; the second, by (2) the crescent, with the crescent upon it; and so on. In the Third House, or family of the third son, the first son is denoted by the mullet, with the label upon it; the second, by the mullet, with the crescent upon it; and so on.

in general, but also abatements (q.v.) or bearings by which the arms of the family are broken or diminished: see BASTARD BAR. But there is a manifest convenience in the practice which is usually followed in Scotland of appropriating the label, the crescent, the mullet, and the rest of the series of marks, commonly known as marks of C., to the purpose of distinguishing the sons from the father, and from each other, during the father's lifetime; and of adopting other distinctions—such as the bordure of

various kinds, the chief engrailed, embattled, and the like, as differences between the coats of brothers, after the death of their father, and of the houses descended from them. Another very common mode of differencing the shields of brothers in early times was by changing the tinctures; but this is now regarded as too extensive a change for such a purpose. The method of differencing by means of the ordinary marks of Cadency is shown in the accompanying illustration. Fanciful reasons have been imagined by heralds for assigning these different marks to the different sons.

The differences at present used by the royal family will be found in most of the peerages. The rule with regard to them seems to be that, unlike subjects, they all bear the label of three points argent; but the label of the Prince of Wales is plain, while those of the other princes and princesses are charged with crosses, fleurs-de-lis, hearts, or other figures, for the sake of distinction. One of the most frequent reasons for matriculating the arms of the younger branches of families of distinction in the Lord Lyon's Register is that they may be properly distinguished from those borne by the head of the house.

CA'DER I'DRIS (Chair of Idris, a reputed giant): picturesque mountain in Merionetshire, Wales, 5 m. s.s.w. of Dolgelly. It consists of an immense ridge of broken precipices, 10 m. long, and 1 to 3 m. broad; the highest peak reaching 2,914 ft. It is composed of basalt porphyry, and other trap rocks, with beds of slag and pumice. The view from the summit, which is very extensive, includes the Wrekin in Shropshire, and St. George's Channel almost to the Irish coast.

CADET, n. *kă-dĕt'* [F. *cadet*, the younger son of a family—from Prov. *capdet*—from mid. L. *capitet'tus*, a little head—from L. *caput*, the head: Sp. *cabdillo*, lord, master: Icel. *cad*, a new-born offspring]: term allied in meaning to *cadency* (q.v.) in heraldry—second son or little head of the family; a younger son; a young man in a military school; a youth appointed to the army, but not yet holding a commission. CADET'-SHIP, n.

The word cadet was formerly used in reference to the youngest son of a family—the practice being in France to provide commissions in the army to the youngest son, thus giving rise to the military sense of the word—but now, generally, to denote a student in a military school, either in the naval or military service; not a commissioned officer but an applicant for a commission. Thus in the United States we have cadets at the military academy, West Point, N. Y., and at the naval academy, Annapolis, Md., students for commissions in the army and navy. While not enlisted men, or commissioned officers, they are still part of the military establishment, and after graduation

are duly commissioned and assigned to regiments and ships.

Formerly each Representative in Congress appointed a cadet to the U. S. Military Academy and one to the U. S. Naval Academy, there being as many cadets at each as there were Representatives in Congress. Also 10, appointed at large to each, by the President of the United States. Later the number has been increased to one additional for each U. S. Senator, and the number appointed by the President increased to 20.

A great many colleges and schools in the United States form their students in a *corps* of *cadets* similar to that of West Point. Systematic courses of military instruction are prescribed, and regular officers of the army assigned to duty as instructors in the practical and theoretical work. Certain of these cadets may be selected for superior ability, examined by a board of regular army officers, and after passing a satisfactory examination, commissioned in the regular army.

A large number of students are annually thus instructed, greatly assisting in the military education of the young men of the country, who may be called upon to perform military duty in time of war.

Certain of these colleges are especially excellent in their course of instruction. The names of not to exceed three of the most distinguished students are published annually in the Official Army Register of the United States Army for the current year. In the last Army Register 44 institutions in the different states having military instructors detailed from the U. S. army, graduated 123 distinguished cadets proficient in military subjects. Of these probably 12 were commissioned in the U. S. army.

CADET'S FUMING LIQUOR: see CACODYLE.

CADGE, v. *kăj* [*cadge*, the round frame of wood on which the hawks were carried: W. *côd*, a bag or pouch]: in *Scot.*, to hawk or carry about for sale, as fish, and the like. CADG'ING, imp. CADGED, pp. *kăjd.* CADGER, n. *kāj'ĕr*, one who brings butter, eggs, and poultry to the market; a huckster.

CADI, n. *kā'dĭ* [Arabic]: a judge or person learned in the law; an inferior judge among the Mohammedan nations, who, like the Mollah (q.v.), or superior judge, must be chosen from the higher ranks of the priesthood, as all law is founded upon the Koran.

CADILLAC, n. *ka-dĭl'lăk* [from *Cadillac*, town in the dept. of the Gironde, France]: a kind of pear.

CADILLAC, *kâ-dēl-yâk'* ANTOINEDE LA MOTHE: a Gascon explorer, who came to Acadia, and obtained a grant of Mt. Desert Island, off the coast of Maine, in 1691. He held command at Michilimackinac 1691–97, and later at Detroit, which he founded 1701; was gov. of Louisiana 1712–17, tried unsuccessfully to work silver-mines and open trade with Mexico, built several

forts, and had trouble with the Natchez Indians. He died about 1720: in 1787 his descendants recovered possession of some of his lands in Maine.

CADIZ, *kā'dĭz* (ancient Gades): important commercial city of Spain, cap. of the modern province of Cadiz, part of the great division of Andalusia; at the extremity of the long narrow isthmus of the Isle of Leon; lat. 36° 32′ n., long. 6° 17′ w. The Atlantic washes its w. and part of its s. side, and on the n. and n.e. it is inclosed by the Bay of Cadiz, a deep inlet of the ocean, forming an outer and an inner bay. Connected by only a narrow strip of ground (in some places not above 200 yards across) with the mainland. Cadiz is admirably situated for defense; but though it has several sea and land fortifications, the place is not considered impregnable. The town, which is surrounded by walls, forms nearly a square, each side about a mile and a half in length. The houses being built of white stone, the city presents a remarkably bright and clean appearance from the sea. The streets are well-paved and lighted, regular, but narrow, and there are some pleasant public walks, the most frequented of which is the Alameda. It has few public buildings of note; its two cathedrals are, on the whole, poor specimens of ecclesiastical architecture, and its pictures, with the exception of one or two excellent pieces by Murillo, are of little value. Cadiz declined greatly as a commercial city after the emancipation of the Spanish colonies in S. America; but owing partly to the recent extension of the railway system in Spain, and partly to the establishment of new lines of steamers, the trade has, within 30 years, revived considerably. Quite lately there has again been serious depression. The exports are wine, olive-oil, fruits, salt, and metals. The manufactures are glass, woolen cloth, soap, hats, leather, etc.

Cadiz is one of the most ancient towns in Europe, having been built by the Phœnicians, under the name of Gaddir, 347 years before the foundation of Rome, or about B.C. 1100. It afterward passed into the hands of the Carthaginians, from whom it was captured by the Romans, who named it Gades, and under them it soon became a city of vast wealth and importance. Occupied afterward by the Goths and Moors, it was taken by the Spaniards in 1262. In 1587, Drake destroyed the Spanish fleet in the bay; nine years later, it was pillaged and burned by Lord Essex; in 1625 and 1702, it was unsuccessfully attacked by other English forces. After the revolution of 1808, Cadiz became the headquarters of the insurrectionary junta, by whose orders it was separated from the mainland. The French, 1018, Feb., commenced a blockade, which they vigorously persevered in, capturing several of the forts, until 1812, Aug. 25, when the victories of the Duke of

Wellington forced them to abandon it. The city was besieged and taken by the French 1823, and held by them till 1828. In the Spanish revolution of 1868, Cadiz acted a noted part. Pop. (1887) 82,531; (1900) prov., 452,659; city, 69,382.

CADMEAN, a. *kăd-mē'ăn*, or CADMIAN, *kăd'mĭ-an:* relating to *Cadmus*, who is said to have introduced into Greece the sixteen simple letters of the alphabet, hence called *Cadmean* letters. CADMEAN VICTORY, a victory in which the conquerors suffer as much as their enemies—so named from the fable of Cadmus, who, by throwing money among the armed men who sought his life, caused them to fight and slay each other for its possession. See CADMUS.

CADMIA, *kăd'mĭ-a:* term applied to the crust formed in zinc furnaces, and which contains from 10 to 20 per cent. of cadmium.

CAD'MIUM, *kăd'mī-um:* a metallic element resembling zinc in its chemical properties, and discovered by Stromeyer in 1817, in a specimen of zinc carbonate. Cadmium often occurs in ores of zinc to a small extent, blende sometimes containing as much as 3 per cent. of cadmium sulphide. The commercial supply of the element is obtained as a by-product in the smelting of zinc, chiefly in Belgium and Silesia. Cadmium sulphide also occurs native as the mineral greenockite (q.v.), otherwise known as 'cadmium blende.' In the distillation of zinc ores the cadmium, being more volatile, passes over first; and advantage is taken of this fact for the isolation of the metal in the arts. In Silesia, where the zinc ores often contain considerable quantities of cadmium, the first portion of the distillate is likely to contan as much as from 3 to 10 per cent. of cadmium. This is mixed with coal or charcoal and redistilled at a low, red heat. Cadmium mixed with a little zinc, passes over; and by one more distillation the metal is obtained in a fairly pure form. To eliminate the last traces of zinc, the crude metal is dissolved in hydrochloric acid, then diluted, and precipitated as a sulphide by a current of sulphuretted hydrogen. The sulphide thus obtained is then dissolved in concentrated hydrochloric acid, and the subsequent addition of carbonate of soda precipitates the carbonate of cadium, which is reduced to the oxide upon ignition. The pure oxide thus obtained may then be reduced to the metallic form by distillation with charcoal. Metallic cadmium is lustrous and resembles tin in appearance, though it has a bluish tinge. It is stronger than tin, but, like that metal, it emits a peculiar crackling sound, or 'cry,' when bent. At ordinary temperature it is quite ductile and malleable, and may be drawn into thin wire, rolled into thin sheets, or hammered into foil. At about 175° F. it becomes

brittle, however, so that it can be pulverized in a mortar. Cadmium has the chemical symbol Cd. Its specific gravity is about 8.65. It melts at 600° F., and boils at about 1,500° F., yielding a yellow vapor. Its atomic weight is 112.4 if O = 16, or 111.6 if H = 1. Metallic cadmium is used to a limited extent in the preparation of alloys, its general effects being to reduce the melting-point of the alloy to which it is added. The total production of the metal per annum is probably about two tons.

The bright yellow sulphide, CdS, is formed when the stream of sulphuretted hydrogen gas is passed through a slightly acid solution of a cadmium salt; and this fact is used in the detection and isolation of cadmium in qualitative analysis. The sulphide is used as a pigment, under the name of 'cadmium yellow'; it is brilliant in color, and does not change upon exposure to air or light.

CADMUS, *kăd'mŭs:* in legend (according to Apollodorus and others), son of Agenor and Telephassa, and brother of Europa. When the latter was carried off by Zeus, he and his brothers, as also their mother, were sent in quest of her, with injunctions from Agenor not to return without her. Their search was vain, and the oracle at Delphi told Cadmus to relinquish it, and to follow a cow of a certain kind which he should meet and build a city where it should lie down. He found the cow in Phocis, followed her to Bœotia, and built there the city of Thebes, about B.C. 1550. The myth of Cadmus, however, like other early Greek myths, abounds in contradictions, and it is impossible to disentangle historical facts from the meshes of this fable. To Cadmus is ascribed the introduction into Greece of an alphabet of 16 letters derived from Egypt or Phœnicia, and the discovery of brass, or introduction of its use.

CADO'GAN, George Henry, (5th Earl), English statesman: b. Durham, 1840, May 12. He was educated at Christ College, Oxford, and entered Parliament as member for Bath in 1873, becoming under-secretary for war in 1875, and under-secretary for the colonies, 1878–80. He was lord privy seal, 1886–95, and lord-lieutenant of Ireland, 1895–1902.

CADOL, Victor Edouard, *vĕk-tōr ĕd-ô-ârd ka-dōl,* French dramatist: b. Paris 1831; d. 1898. He was long prominant as a journalist, being on the staff of *Le Temps* and one of the founders of *L' Esprit Francais.* Among his very numerous works, many of which were written in collaboration, are *Les ambitions of de M. Fauvel* (1867); *Thérèse Gervais* (1893); *L'archduchesse* (1897). A corrected edition of his dramas appeared in 1897 entitled *Théâtre inédit.*

CARDONA, Raffaele, *râf-fâ-ĕl' kâ-dôr-na,* Italian general: b. Milan 1815; d. Turin, 1897, Feb. 6. He

served in the Crimean war, and in 1860 was made war minister in Tuscany's provisional government, and military commandant of Sicily in 1866. He suppressed the Bourbon insurrection in Palermo in the latter year, and in 1870 captured Rome and was its military governor for a time. In 1871 he entered the Italian Senate. He was the author of *La liberazione di Roma nel 1870* (1889).

CADOUDAL, *kâ-dô-dâl'* GEORGE: a leader in the Chouan or Royalist war in Brittany: 1771–1804, June 25; b. near Auray, Lower Brittany; son of a miller. He was among the first to take up arms against the Republic, and soon acquired great influence over the peasants. Captured in 1794, he was sent as a prisoner to Brest, whence he soon made his escape, imprisonment having only increased his loyal ardor. Annoyed at the dissensions between the Vendean generals and the emigrant officers, and the disasters consequent thereon, Cadoudal organized an army in which no noble was permitted to command, and which Hoche, with all his great military talents, was unable to subdue or disperse. In 1799, Cadoudal was the soul of the conspiracy to overthrow the First Consul, and place a Bourbon on the throne; but the events of the 18th Brumaire disarranged the plans of the conspirators. Bonaparte recognized Cadoudal's energy and force of character, and offered to make him a lieut.-gen. in his army, which offer Cadoudal refused, as well as another of a pension of a hundred thousand francs, if he would only consent to remain quiet. Bonaparte attempted to arrest him, but he fled to England, where, 1802, he conspired with Pichegru for the overthrow of the First Consul. With this design he went to Paris, but was arrested, condemned, and put to death. Cadoudal was a man of stern honesty and indomitable resolution. 'His mind was cast in the true mold; in my hands he would have done great things,' was Napoleon's estimate of him.

CADRE, n. *kā'dr* [F. *cadre,* a frame—from It. *quadro,* a square]: the framework or fourth part of a thing; a skeleton; a body wanting bone and sinew to make it effective; in *mil.,* the frame or skeleton of a regiment, as after the Indian mutiny when the sepoys of certain regiments mutinied, the officers and men, if any remained, were styled the *cadres* of them.

CADUCEAN, a. *kăd'ū-sē'ăn* or *kă-dū'sĕ-ăn* [L. *cadūcĕŭm,* a herald's staff: It. *caducco:* F. *caducée*]: belonging to Mercury's *cadūcĕŭs* (q.v.).

CADUCEUS, *ka dū'sē-ŭs:* in myth, the winged staff of Mercury, or Hermes, as he was called by the Greeks, which was supposed to give the god power to fly. The Caduceus in the actual world was the staff or mace carried by heralds and ambassadors, from which, no doubt, it came to form one of the attributes of the mes-

senger of the gods. Originally, it was simply an olive-branch, the stems of which were afterwards formed into snakes, in accordance with several poetical tales invented by the mythologists. One of these was to the effect that Mercury, having found two snakes fighting, divided them with his rod, and that thus they came to be used as an emblem of peace. Many miraculous virtues were ascribed to the Caduceus. On the coinage of antiquity, the Caduceus is often given to Mars, who holds it in the left hand, a spear being in his right, to show how peace and war alternate. It is also seen in the hands of Hercules, Bacchus, Ceres, Venus, etc. Among the moderns, the Caduceus is used as an emblem of commerce, over which Mercury was the presiding divinity.

CADUCIBRANCHIATE, *kă-dŭ'sĭ-brăng'kĭ-āt* [L. *cădū-cus*, falling off; and Eng. *branchiate*]: applied to those amphibians in which the gills fall off before maturity is reached.

CADUCOUS, a. *kă-dū'kŭs* [L. *cadūcŭs*, falling—from *cado*, I fall]: falling early, as a leaf; having a tendency to fall off; denoting parts of an animal that fall off during life.

CADWALADER, *kăd-wŏl'a-dĕr*, JOHN: 1743–1786, Feb. 10; b. Philadelphia. He was member of the Penn. Convention of 1175 and of the Committee of Safety, and commanded the Philadelphia 'Silk Stocking Company,' of which nearly all the members became army officers. He was promoted to colonel, and in 1777 to brig.-gen.; took part in the battles of Trenton, Princeton, the Brandywine, Germantown, and Monmouth; organized the Md. Militia in the fall of 1777; called Gen. Conway to account for attacks on Washington, and wounded him in a duel; removed to Md., was a member of its legislature, and died at Shrewsbury.

CÆCILIA, *sē-sĭl'ĭ-a L. cœcus, blind*]: genus of reptiles, formerly placed among serpents, on account of their form, though in their anatomical structure peculiarities were observed allying them to Batrachians, with which they are now ranked, the important fact having been ascertained of their breathing by gills when young, and undergoing a metamorphosis. The body is almost cylindrical or worm-like, the head small, the eyes very small, and nearly hidden by the skin; in some species, indeed, imperfect or wanting, upon which account the name Cæcilia was given to them, and an attempt has been made to transfer to them the English name Blindworm, commonly given to the *Anguis fragilis*. The skin is smooth, viscous, and annularly wrinkled, appearing naked, although, upon dissection, minute scales are found disposed between its wrinkles, at least in some species. The vertebræ are articulated as in fishes and in some of the other lower Batrachians, not as in serpents, and the skull is united to the first vertebra by two tubercles. The ribs are

too short to encircle the trunk.—The original genus C. has been subdivided, now forming a family, *Cæciliadæ*. The species are inhabitants of warm climates, and of marshy or moist places.

CÆCUM, n. *sē′kŭm* [L. *cæcus*, blind]: in *anat.*, the blind gut, applied to a diverticulum or offshoot of the intestinal canal. CÆCAL, a. *sē′kăl*, pertaining to; having a closed end.

CÆCUM: a blind sac; that is, a sac or bag having only one opening, connected with the intestine of an animal. In man there is only one C., very small, apparently not performing any important function, situated at the extremity of the small intestine where it terminates in the large intestine or colon. In many of the mammalia, however, and particularly in most of those which are herbivorous, it is comparatively large, and secretes an acid fluid resembling the gastric juice. It therefore appears that, where the nature of the assimilatory process is such as to require the detention of the food for a considerable time, this provision is made for it, in order that digestion may be more complete. The C. is entirely wanting in some quadrupeds, as in bats, and the bear and weasel families. Birds have two cæca, usually long and capacious in those that are omnivorous or granivorous; and their position is all that marks the division of the intestine into two parts, the small and the large intestine, or the *ileum* and the *colon*. In reptiles, a C. is very rare. Fishes have none in the position occupied by those of quadrupeds and birds, but many of them have cæca attached to the intestine at its uppermost part, and generally regarded as appendages of the stomach. The number of these cæca is, however, extremely various; sometimes there are only 2, and sometimes more than 100. The number is different even in very nearly allied species of the same family; thus, there are 6 in the smelt, but 70 in the salmon; 24 in the herring, and 80 in the shad. In some fishes, the cæca consist of large trunks ramified into smaller ones.

CÆDMON, *kĕd′mŭn* or *kăd′mŭn:* d. abt. 680: first English writer of note who used his own Anglo-Saxon language. It has, indeed, been debated whether all the poems extant under his name are by him; the only remaining manuscript of the paraphrase is of the 10th c., and gives no indication of the authorship. But the substance of the work agrees well with that attributed to C. In Bede's account of his miraculous illumination, he was originally a cowherd, attached to the monastery of Whitby, and 'even more ignorant than the majority of his fellows, so that in the evenings, when the domestics assembled in the hall to recreate themselves with music after the labors of the day, Cadmon was frequently obliged to retire, in order to hide his shame when the harp was moved toward him.' One night, however, as he was sleeping in the stable-loft, a stranger appeared to him, and commanded him to sing. C. declared his ignorance, but the stranger would take no refusal, and imposed on the poor cow-herd the sublime task of hymning the glories of

creation. Suddenly, a poetic inspiration seized him, and he began to pour forth verses. When he awoke from his dream, the words remained in his memory, and were recited by him to others with new confidence. The Abbess Hilda, and the learned men who were with her in the monastery, immediately declared that he had received the gift of song from Heaven. He was now educated, became a monk, and spent the rest of his life in composing poems on the Bible histories and on miscellaneous religious subjects, many of which have been preserved, and are altogether in bulk nearly equal to the half of *Paradise Lost*, to parts of which some of them bear a striking resemblance. Satan's Speech in Hell is characterized by a simple yet solemn greatness of imagination, which may possibly have influenced at some period of his life the more magnificent genius of Milton.

CÆLATU'RA: see CHASING.

CÆLIUS MONS: see ROME.

CAEN, *kŏng:* chief town in the dept. of Calvados, France—formerly cap. of Lower Normandy; on the left bank of the Orne, about 9 m. from its mouth, 122 m. w.n.w. of Paris. C. is built in the middle of a fertile plain; its streets are wide and clean, it has several fine squares, and many noble specimens of ancient Norman architecture. Among the best examples are the churches of St. Etienne, founded by William the Conqueror, and which contained his monument, erected by William Rufus, and destroyed by the Huguenots, 1562; La Trinité, called also *Abbaye aux Dames*, founded by Matilda, wife of the Conqueror; St. Nicholas, now a cavalry fodder-store; St. Pierre, and St. Jean. The castle, founded by the Conqueror, and finished by Henry I. of England, was partially destroyed, 1793. There are several beautiful promenades in the city, which has manufactures of lace, blonde, crape, cutlery, cotton-yarns; breweries, dye-works, wax-bleaching, and ship-building yards. Its Angora gloves, made from the unwashed, undyed fur of Angora rabbits, which are reared in the district, are celebrated. Quarries in the neighborhood produce an excellent stone, called Caen Stone (q.v.). Trade is facilitated by a maritime canal connecting the port with the sea, also by the railway connecting it with the Paris and Rouen line; those to Cherbourg, Tours, and Honfleur, and that to Flers, opened 1867, which affords C. communication with Granville. Nothing is known of C. before the 9th c. It was a place of importance in 912, when it came into the possession of the Normans, under whom it increased rapidly. William the Conqueror and his queen made it their residence, and greatly improved it. In 1346, it was taken and pillaged by the English, who again captured it, 1417, and held it till 1450, when the French compelled them to surrender. During the revolution of 1793, several of the Girondist chiefs, proscribed by the Jacobins, went to C., and organized a revolt against the Mountain, which proved unsuccessful. Pop. (1901) 44,794.

CAEN STONE: building stone from the neighborhood

of Caen, Normandy. The region has been celebrated fc its stone-quarries from a very early period. The excellence of the stone, and the facility of transport by sea, led to its extensive use in England in the 15th and 16th c. In 1460 the Abbot of Westminster obtained a license to import C. S. for the repairs of the monastery. Later it became a regular article of importation, and in 1582 it was rated at the custom-house at 6*s.* 8*d.* the ton. Winchester and Canterbury cathedrals, Henry VII.'s Chapel at Westminster, and many country churches, are built of C. S., which is still frequently used in England, and to some extent in the United States. The stone, which usually has a somewhat creamy color, is an oolite, resembling Stonesfield slate, but without its slaty structure. The quarries are subterraneous, and the stone is brought up through vertical shafts in blocks 8 or 9 ft. long, and about 2 ft. thick.

CÆRE: see CERVETERÉ.

CAERLEON, *kėr-lē'on* (Castle of the Legion): small ancient town in Monmouthshire, England, on the right bank of the Usk, 2 m. n.e. of Newport. It is the Isca Silurum of the Romans, supposed to have been cap. of the Roman province Britannia Secunda, now Wales, and the residence of the famous King Arthur. It was the seat of an ancient archbishopric, which was removed to St Davids about A.D. 519. An abbey of Cistercian monks existed here before the Reformation. C. was an important place in the 12th c., but was afterward ruined by the frequent wars between the Welsh and Anglo-Saxons. Many Roman relics have been found here, as aqueducts, baths, pavements, altars, tiles, coins, inscriptions, and statues; many of the smaller antiquities are deposited in a museum in the town; besides half-melted ore and cinders, and the remains of a fortress, with walls 12 ft. thick and 1,800 yards long, and of an amphitheatre, called King Arthur's Round Table, 222 by 192 ft. in size. The chief occupation is the manufacture of tin-plates. Pop. abt. 1,500.

CAERMARTHEN, *kėr-mâr'thėn* (Welsh, *Caer Fyrddyn*, the *Maridunum* of Ptolemy): seaport town, cap. of Caermarthenshire, s. Wales, on the right bank of the Towy, 9 m. from Caermarthen Bay. It has a picturesque situation, but the streets are irregular, steep, and often narrow. The Towy is navigable for vessels of 200 tons up to the town, and salmon and sewin are caught in the river. There are tin and iron works near. C. exports tin-plates, cast-iron, timber, marble, bark, slates, lead ore, bricks, grain, butter, and eggs. The Welsh language is used in most of the churches. There is a college for Welsh teachers. C. is a county borough, having a separate jurisdiction from the shire. It unites with Llanelly in returning one member to parliament. Near C. are the remains of two Roman camps. In the 5th c. Merlin, the Welsh prophet, is said to have been born here. It was long the residence of the native princes of s. Wales. Caermarthen Castle often changed hands in the contests of the Welsh chiefs with

each other, and in the subsequent wars with the Saxons and Normans. Pop. of C. 10,512; (1891) 10,514.

CAERMARTHENSHIRE, *kèr-mâr'thèn-shèr:* maritime county in s. Wales, on the Bristol Channel; bounded n. by Cardigan, from which it is separated by the Teify; e. by Brecknock; s. by Glamorgan and Caermarthen Bay; and w. by Pembroke. It is the largest of the Welsh counties; length, 53 m.; greatest breadth, 33 m.; 974 sq. m., nearly a third of which is waste. The country is mountainous in the n. and e., and is characterized by productive though narrow valleys and deep, wooded glens. Caermarthen Van or Beacon rises 2,596 ft., the greatest elevation in the county. The coast of C. is marshy, and is on Caermarthen Bay, which washes also small portions of the coasts of Glamorgan and Pembroke. The bay is 17 m. across, 10 m. deep, 35 in circuit, and receives the rivers Taff or Tave, Towy, and Lhoughor. The chief rivers of C. are the Towy, Cothy, Taff, and Teify. The Towy has a course of 60 m., of which 50 are in Caermarthenshire. It yields plenty of salmon, sewin, trout, eels, and lamprey, and is navigable for its lower 9 m. On this river is the celebrated vale of the Towy, 30 m. long, with an average breadth of 2 m. C., n. and w. of the Towy, comprising three-fourths of the county, consists of lower Silurian clay-slate and grauwacke. In the s.e. corner of the county is a band of carboniferous limestone and grit, to which succeeds a small part of the s. Welsh coal-field of Glamorgan and Monmouth, chiefly composed of stone-coal and culm. The mineral productions of the county are iron, coal, copper, lead, slates, lime, dark-blue marble, These, with tinned iron, grain, cattle, horses, sheep, and butter, are exported. The climate of C. is mild, but moist; the soil is stiff and poor in the uplands, affording pasturage for small cattle; but the rest of the county is well wooded, and in the s. part along the rivers very fertile. Oats and barley are the chief crops. The chief towns are Caermarthen (county town), Llanelly, Llandeilo-vawr, Llandovery, Newcastle-in-Emlyn. Chief manufactures are woolens and hides. C. sends two members to parliament. The county contains so-called Druidical remains and Roman roads, besides many baronial and ecclesiastical ruins. In this county originated the 'Rebecca' riots, which in s. Wales, 1843–4, were directed against the turnpike-gates. Pop. (1871) 115,710; (1881) 124,861; (1891) 130,574; (1901) 135,326.

CAERNARVON, *kèr-nar'von* (*Caer-yn-ar-Fon,* Fort opposite Mon or Anglesea): parliamentary and municipal borough and seaport in n. Wales, cap. of Caernarvonshire; near the s. end of the Menai Strait, on the right bank of the Seiont, 245 m. n.w. of London. C. has a castle at the w. end of the town, the building of which was begun by Edward I., 1284. It is one of the noblest ruins in the kingdom, the walls being still entire, and inclosing an oblong of three acres. The walls are 7 to 9 ft. thick, pierced by a covered gallery, with loopholes for arrows. There are 13 embattled towers with five, six, or eight sides, and sur-

mounted by turrets. The gateway under the great square tower has four portcullises. The town itself was formerly surrounded by walls and round towers. These walls, with several of the gates, still stand, but are now within the town. The streets are narrow, but regular, and at right angles to each other. In the churches and chapels, the services are in Welsh and English. C. unites with Pwllheli, Nevin, Criccieth, Conway, and Bangor in returning one member to parliament. In 1880, 2,256 vessels, with a burden of 149,706 tons, entered, and 2,389 vessels, with a burden of 172,021 tons, cleared the port, chiefly small-craft and steamers to and from Liverpool. The harbor admits ships of 400 tons. Chief exports are copper ore, coal, and slates. There is also a great iron and brass foundry. C. is a bathing-place, and is much frequented by tourists, on account of its vicinity to the grandest scenery in n. Wales. Many families of the upper ranks reside in and around the town. Half a mile from C. are the remains, covering seven acres, of Segontium, or Caer Seiont, a Roman station or city. Gold, silver, and copper coins and ornaments, and other Roman relics, have been found here. There is a Roman fort on the left bank of the Seiont, still almost complete, with walls 11 ft. high, and 6 ft. thick, and with parallel rows of holes 3 inches in diameter. C. was the seat of the native princes of n. Wales till 873. In 1284 was born here the first Anglo-Norman Prince of Wales, afterward the unhappy Edward II. In 1294, the town and castle were burned, and the English inhabitants massacred by the Welsh under Madoc, illegitimate son of Llewelyn, a native prince of Wales. From a rocky height near Uxbridge Hotel, there is a fine view of Snowdon and the island of Anglesea. Pop. (1881) 10,237; (1891) 10,514.

CAERNARVONSHIRE, *kĕr-nar'von-shĕr:* maritime county in n. Wales, bounded n. by the Irish Sea; e. by Denbigh, with the Conway between; s. by Merioneth and Cardigan Bay; and w. by Caernarvon Bay and the Menai Strait, the latter separating it from Anglesea. It is 51 m. long; greatest breadth, 22 m.; average, 9; 544 sq. m., of which one-half is in pasture, and only one-fortieth in tillage. The surface is mountainous, and is traversed by the grandest ranges in s. Britain, and it is the highest and most mountainous county in n. Wales. The Snowdonian or chief range runs through the middle of the greatest length of the county, from s.w. to n.e., and is very bold and rocky. It attains its greatest elevation in Snowdon (q.v.), 3,571 ft., in the centre of the county, and the highest mountain in s. Britain. Caernarvon Bay is 30 m. across, 15 long, with 2 to 30 fathoms water, and communicates with the Irish Sea through the Menai Strait, which is 17 m. long, and one-third m. to 4 m. broad. The rivers of C. are numerous, but small, from the nearness of all parts of the county to the sea. The Conway, navigable 10 m., which runs along the e. border, is the chief. Almost all the streams flow through small lakes or tarns—of which there are 50 or 60 in the county—around the central or Snowdonian group of mountains. There are many fine cataracts on these streams. The mineral products of C. are

copper, lead, zinc, coal, roofing and writing slates, slabs, chimney-piers, honestone. The slate-quarries employ many thousand workmen. The climate is mild in the peninsular part of C., but severe among the hills. Large numbers of black-cattle are reared; the sheep are numerous but small. Wheat, oats, barley, and potatoes are raised in the valleys. The chief towns are Caernarvon (the county town), Bangor, Pwllheli, Conway, Nevin, and Criccieth. In addition to the above boroughs, several flourishing towns have recently sprung into existence in the county—Llandudno, Tremadoc, and Bethesda being the principal. It returns two members to parliament—one for the county, and one for the six chief towns. Connected with C. is the Chester and Holyhead railway, on the great route from London to Dublin, which crosses into Anglesea by the Britannia Tubular Bridge over the Menai Strait. C. contains the remains of British or Celtic camps and hill-forts, especially around Snowdon, several dolmens and stone circles, and some ancient castles. The Snowdonian mountains were long the stronghold of the Welsh against the Romans, Saxons, and Normans in their efforts to subjugate Wales, and here the Welsh were at last defeated in 1283 by Edward I. Pop. (1901) 125,669.

CÆSALPINIA, *sē-zăl-pĭn′ĭ-a*: genus of trees of the nat. ord. *Leguminosæ* (q.v.), type of the sub-order *Cæsalpinieæ*. This sub-order is characterized by irregular flowers, which are not papilionaceous (q.v.), and contains upward of 700 known species, among which many are notable for purgative properties, as Senna (q.v.); some pruduce eatable fruits, as the Tamarind (q.v.), the Carob (q.v.), and the West Indian Locust Tree (q.v.); some yield resinous and balsamic products, as Copaiva (q.v.), Aloeswood (q.v.), etc.; some produce important dye-woods, as Logwood (q.v.), Brazil Wood (q.v.), Camwood (q.v.), etc.; and some are trees of great size, and very valuable for their timber, as the Purple-heart (q.v.) and the Wallaba (q.v.), trees of Guiana. The sub-order generally belongs to warm climates.—The genus C. contains a number of species, trees with pinnate or bipinnate leaves, natives of the warm parts of Asia and America, which yield the Brazil Wood, Pernambuco Wood (see Brazil Wood), and Sappan Wood (q.v.) of commerce, also the astringent pods called Dividivi (q.v.), used in tanning.

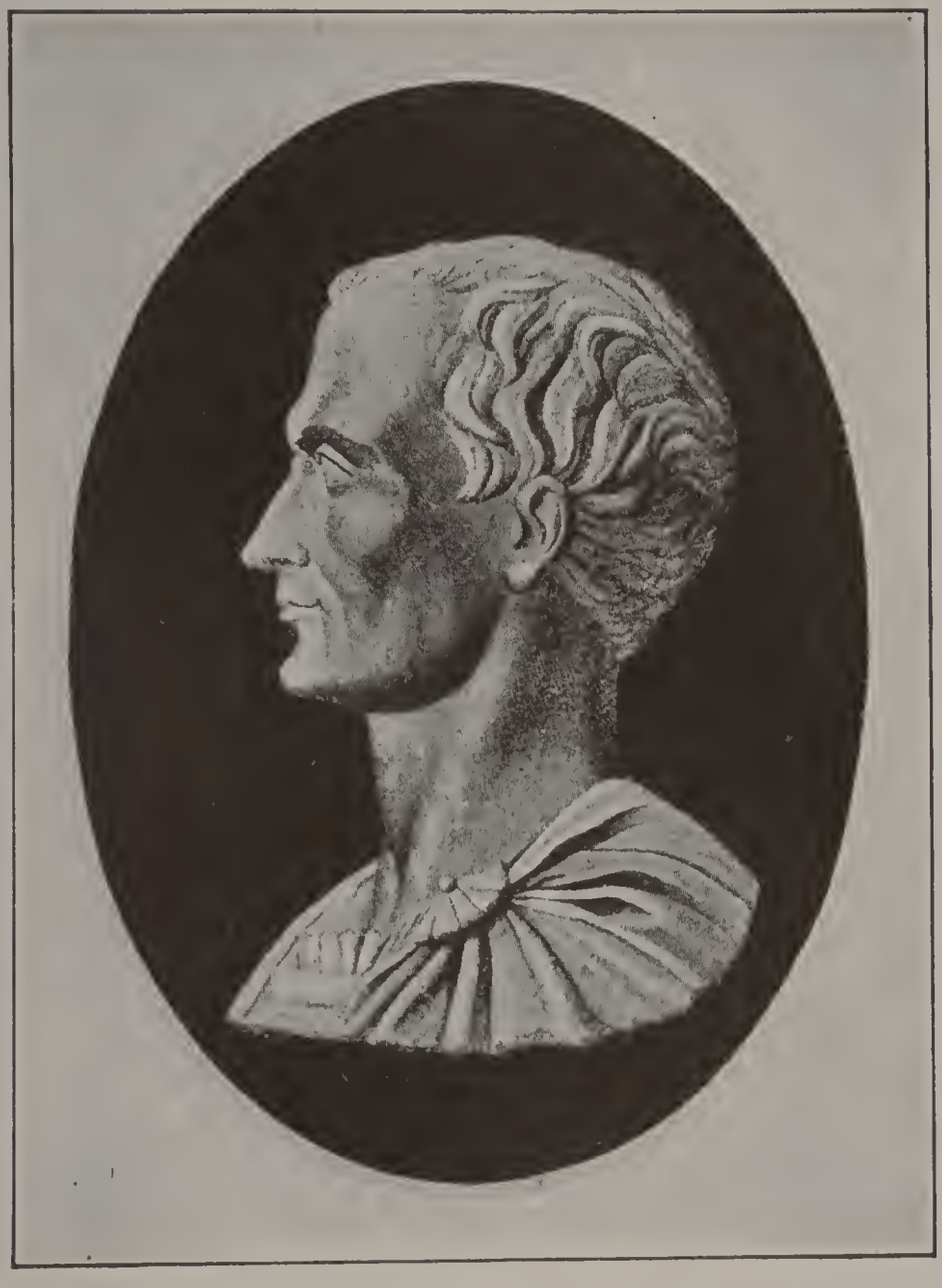
CÆSALPINUS, *sĕs-ăl-pī′nŭs*, or Cæsalpino *chā-zâl-pē′no*, Andreas: 1519–1603, Feb. 23; b. Arezzo in Tuscany; naturalist. He was prof. of botany in the Univ. of Pisa, and from 1592 of medicine in the Sapienza College at Rome, and chief physician to the pope. He anticipated Harvey in discovering the circulation of the blood (see his first book, *Speculum Artis Medicæ Hippocraticum*), and Linnæus in the classification of plants; the latter called him the first orthodox or scientific botanist. His *De Plantis libri XVI.* appeared at Florence 1583. He also treated on the deepest philosophic subjects in his *Questiones Peripateticæ*, Rome, 1603. He died in Rome.

CÆSAR, *sē'zêr:* name of a patrician family of the *Julia Gens,* one of the oldest in the Roman state, claiming to be descended from Iulus, the son of Æneas. When or from what cause the surname of C. was acquired, is utterly uncertain. Spartianus, in his *Life of Ælius Verus,* mentions four different opinions respecting its origin: 1. That the word signified an elephant in the language of the Moors, and was given as a surname to one of the Julii because he had killed an elephant; 2. That it was given to him because he had been cut (*cæsus*) out of his mother's womb after her death; 3. Because he had been born with a great quantity of hair (*cæsaries*); or, 4. Because he had azure-colored eyes (*cæsii*). Who was the original Cæsar of the gens, is not known; the first mentioned in history is Sex. Julius Cæsar, prætor B.C. 208. The greatest individual of the family, and one of the greatest men in history, was CÆSAR, CAIUS JULIUS (q v.).

CÆSAR, CAIUS (or rather GAIUS) JULIUS, Consul and Dictator of Rome: conqueror: B.C. 100, July 12—B.C. 44, Mar. 15; son of a Roman pretor of the same name. Two circumstances conspired to determine his sympathies in favor of democracy, and against a republican oligarchy: the first was the marriage of his aunt Julia with Caius Marius; the second, his own marriage, B.C. 83, with Cornelia, daughter of L. Cinna, one of the principal enemies of Sulla. The anger of the dictator at this cost C. his rank, property, and almost his life itself. Feeling that he would be safer abroad for a time, he went to Asia, B.C. 81; but on learning the death of Sulla (B.C. 78), he hurried back to Rome, where he found the popular party in a state of great ferment, and anxious to regain what it had lost under the vigorous despotism of the aristocratic dictator. C., however, took no part in the attempts of Lepidus to overthrow the oligarchy; but he showed his political leanings by prosecuting (B.C. 77) Cn. Dolabella—a great partisan of Sulla—for extortion in his province of Macedonia. To improve his eloquence, he went to Rhodes to study under the rhetor Apollonius Molo. In B.C. 74, he returned to Rome, where he had been elected pontifex, and now for the first time threw himself earnestly into public life. In B.C. 70, he attached himself to Pompey, whose political actions at this time were decidedly democratic. In B.C. 68, C. obtained a questorship in Spain. On his return to Rome (B.C. 67), he married Pompeia, a relative of Pompey, with whom he was daily becoming more intimate. In B.C. 66 he was elected to the curule ædileship, and lavished vast sums of money on games and public buildings, by which he increased his already great popularity. For the next few years, C. is found steadily skirmishing on the popular side. In B.C. 63 he was elected pontifex maximus, and shortly

after, prætor. During the same year occurred the famous debate on the Catiline conspiracy, in which the aristocratic party vainly endeavored to persuade the consul, Cicero, to include C. in the list of conspirators. In B.C. 62, Pompey returned from the East, and disbanded his army. Next year, C. obtained the province of *Hispania Ulterior*. His career in Spain was brilliant and decisive. On his return, he was elected consul, with M. Calpurnius Bibulus. Shortly before the passing of the agrarian law (B.C. 59), C., with rare tact and sagacity, had reconciled the two most powerful men in Rome, who were then at variance, Pompey and Crassus, and had formed an alliance with them, known in history as the *First Triumvirate*. Both of these distinguished men aided C. in carrying his agrarian law ; and to strengthen still further the union which had been formed, C. gave Pompey his daughter, Julia, in marriage, though she had been promised to M. Brutus; while he himself also married Calpurnia, daughter of L. Piso, his successor in the consulship. On the expiry of his term of office, he obtained for himself, by the popular vote, the province of *Gallia Cisalpina* and *Illyricum* for five years, to which the senate added—to prevent the popular assembly from doing so—the province of *Gallia Transalpina*. Nothing could have been more favorable for C.'s aims. He had now an opportunity of developing his extraordinary military genius, and of gathering round him an army of veterans, whom perpetual victory should inspire with thorough soldierly fidelity and devotion to his person. This was the very thing he wanted to give him a reputation equal to that of his coadjutors, Pompey and Crassus, whom, in genius, he far surpassed. Leaving, therefore, the political factions at Rome to exhaust themselves in petty strifes, C., in B.C. 58, after the banishment of Cicero, repaired to his provinces, and during the next nine years conducted those splendid campaigns in Gaul, by which, had he done nothing else, he would have 'built himself an everlasting name.' C.'s first campaign was against the Helvetii, whom he totally defeated near Bibracte (Autun). Out of 368,000 only 110,000 remained. These were commanded by C. to return home, and cultivate their lands. The eyes of the Gauls were now turned upon the new conqueror. His help was solicited, among others, by Divitiacus, an Æduan chief. This involved C. in a second war with a German prince, named Ariovistus, who was utterly overthrown ; and now C., having in the course of one campaign successfully concluded two important wars, led his troops into winter quarters.

Next year (B.C. 57) occurred the Belgic war, in which C. successively routed the Suessiones, Bellovaci, Ambiani, and Nervii, who, alarmed at the progress of the Roman arms, had entered into alliance with each other against the invaders. When the senate received C.'s official dispatches, it decreed a thanksgiving of 15 days—an honor never previously granted to any general. During the winter and the spring following, C. staved at Lucca ; and after spend-



CÆSAR.

ing large sums of money in hospitality, and in other ways less praiseworthy, he departed for Gaul, where the flames of war had burst out in the northwest. The Veneti, a maritime people of Brittany, were the chief instigators of the insurrection. C.'s plans were laid with consummate skill, and were crowned with the most splendid success. The Veneti were totally defeated, and most of the other Gallic tribes were either checked or subdued. C. wintered in the country of the Aulerci and Lexovii (Normandy), having, in the course of three campaigns, conquered Gaul. Next year (B.C. 55) Crassus went to Syria, and Pompey to Spain, while C.'s provincial government was prolonged for five years. He now undertook a fourth campaign against two German tribes who were about to enter Gaul. He was again successful; and pursuing the fleeing enemy across the Rhine, spent 18 days in plundering the district inhabited by the Sigambri. He next invaded Britain, about the autumn; but after a brief stay in the island, returned to Gaul. The Roman senate, astonished at his hardihood and his successes in regions where no Roman army had ever been before, accorded him a public thanksgiving of 20 days. In B.C. 54, C. opened his fifth campaign by a second invasion of Britain. On his return to Gaul, C. was compelled—on account of the scarcity of corn, arising from drought—to winter his army in divisions. This naturally aroused the hopes of the Gauls, who thought the time had come for recovering their independence. An insurrection broke out in the n.e. of Gaul, which was at first partially successful, but was ultimately crushed. C. resolved to winter at Samarobriva (Amiens), in the vicinity of the malcontents. In B.C. 53, C. commenced his sixth campaign. It was chiefly occupied in crushing a second insurrection of the Gauls. C. now returned to northern Italy, that he might be able to communicate more easily and securely with his friends at Rome. That city was gradually becoming more anarchic, the evils of weak government more apparent; the hour for decisive action seemed to be approaching, and doubtless C.'s heart beat with expectation of the mighty future, when all at once the plot that Fate was weaving in his favor, appeared to be completely marred by a tremendous rebellion over the whole of Gaul, headed by a young warrior named Vercingetorix. It was in the dead of winter when the news came to C., who instantly saw that, at all hazards, he must preserve his fame and his army. Leaving, therefore, Pompey to succeed at Rome, he hurried to meet the insurgent hordes. His great difficulty was to collect his scattered legions. First crossing, with some Cisalpine and provincial troops, the mountains of Auvergne, though they lay six feet deep in snow, he suddenly appeared among the Arverni, who, terrified at his unexpected approach, sent for their chief, Vercingetorix, to come to their assistance. This was what C. wished. After some wonderful exhibitions of military skill and numerous successes, Vercingetorix was shut up in Alesia (Alise in Burgundy) with all his infantry. C. besieged him, and

though harassed by nearly 300,000 Gauls without, who attempted, but in vain, to break through the well-defended Roman lines, forced Vercingetorix to capitulate. Many of the tribes now hastened to submit to C., who prudently determined to winter among the vanquished. The senate, of course, voted him another public thanksgiving. Next year (B.C. 51), C. proceeded to quell the tribes who still held out. This he accomplished, and having in addition reduced the whole of Aquitania, passed the winter of his eighth campaign at Nemetocenna, in Belgium, where he spent the time both in a magnanimous and politic manner. The Gallic princes were courteously and generously treated; the common people were spared the imposition of further taxes, and everything was done to render it possible for him to visit Italy with safety in the spring. This he did, and took up his residence at Ravenna, where he was informed of everything that was going on by the tribune C. Curio. There can be no doubt that at this moment he was the most popular man in the state, while his soldiery were devoted to him with a loyalty as enthusiastic as that which Bonaparte inspired when fresh from his Italian victories.

Meanwhile, Pompey, whose vanity could not endure the greatness of C., had been gradually veering round again to the aristocracy, whose dread of the new conqueror was hourly increasing. After much futile diplomatic finessing on all sides, the senate carried a motion 'that C. should disband his army by a certain day; and that if he did not do so, he should be regarded as an enemy of the state.' The tribunes, Mark Antony and Q. Cassius put their veto on this motion; but they were violently driven out of the senate-chamber, and fearing for their lives, they fled to C.'s camp. The senate, in the madness of their terror, now declared war, and intrusted the conduct of it to Pompey, whose pride in the invincibility of his military prowess hindered him from taking the necessary measures for the defense of the state. He fancied that his name would bring thousands to his standard, and he was even led to believe that C.'s troops were willing to desert their general: the result of which delusion was, that when hostilities formally commenced, he had hardly any soldiers except two legions which had recently been in the service of his rival. C., on the other hand, perceiving that the time for decisive action had at length come, harangued his victorious troops, who were willing to follow him anywhere; crossed the Rubicon (a small stream which separated his province from Italy proper), and moved swiftly, amid the acclamations of the people, toward Rome. Pompey fled to Brundusium, pursued by C., but contrived to reach Greece in safety, B.C. 49, Mar. 17. The Italian cities had everywhere gladly opened their gates to the conqueror as a deliverer. In three months, C. was master of all Italy.

C. next subdued Pompey's legates in Spain, who were at the head of considerable forces. On his return, he took Massilia, where he learned that he had been appointed

THE DEATH OF CÆSAR.

dictator of the republic—a function which at this time he retained only for 11 days, but these were honorably distinguished by the passing of several humane enactments. Pompey, now thoroughly alive to the magnitude of his danger, had gathered in Egypt, Greece, and the East, a powerful army, while his fleet swept the sea. C., however, crossing the Adriatic at an unexpected season, made a rush for Dyrrhachium, where Pompey's stores were; but was nevertheless outstripped by his opponent. Pompey intrenched his army on some high ground near the city, where he was besieged by C. The first encounter was favorable to Pompey, who drove back C.'s legions with much loss. The latter now retreated to Thessaly, followed by his exulting enemies. A second battle ensued on the plains of Pharsalia, B.C. 48, Aug. 9. Pompey's army was utterly routed; Pompey himself fled to Egypt, where he was murdered: see POMPEY.

No sooner had the news reached Rome, than C. was again appointed dictator for a year, and consul for five years. He was invested with tribunicial power for life, and with the right of holding all the magistricial comitia except those for the election of the plebeian tribunes. He did not, however, return to Rome after the battle of Pharsalia, but went to Egypt, then distracted by the disputes regarding the succession. Out of love for Cleopatra (who subsequently bore him a son), he entered upon the 'Alexandrine war,' in which he was successful, and which he brought to a close B.C. 47, Mar. He next overthrew a son of Mithridates, near Zela, in Pontus, Aug. 2, and arrived in Rome in Sep. He was once more appointed dictator, and the property of Pompey was confiscated and sold. Before the close of the year, he had set out for Africa, where his campaign against the Pompeian generals, Scipio and Cato, was crowned with victory at the battle of Thapsus, B.C. 46, Apr. 6. Cato committed suicide at Utica, and with such irresistible celerity was the work of subjugation carried on, that by the end of the summer, C. was again in Rome. Now occurred that display of noble and wise generosity which proves C. to have been possessed of a magnanimous nature. He was not a man that could stoop to the vulgar atrocities of Marius or Sulla, and so he majestically declared that henceforth he had no enemies, and that he would make no difference between Pompeians and Cæsarians. His victories in Gaul, Egypt, Pontus, and Africa, were celebrated by four great triumphs, during which the whole Roman populace was feasted and fêted by the magnificent liberality of the dictator.

He now proceeded to check, by wholesome enactments, as far as in him lay, the social evils which had long flourished in the city. During the year B.C. 46, also, he conferred a benefit on Rome and on the world by the reformation of the calendar, which had been greatly abused by the pontifical college for political purposes. After quelling an insurrection which now broke out in Spain, where Pompey's sons, Cneius and Sextus, had collected an army, he received the title of 'Father of his Country' and also of *imperator*, was

made dictator and *præfectus morum* for life, consul for 10 years; his person was declared sacred, and even divine; he obtained a body-guard of knights and senators; his statue was placed in the temples; his portrait was struck on coins; the month Quintilis was called Julius in his honor; and on all public occasions he was permitted to wear the triumphal robe. He now proposed to make a digest of the whole Roman law for public use, to found libraries for the same purpose, to drain the Pontine Marshes, to enlarge the harbor of Ostia, to dig a canal through the Isthmus of Corinth, and to quell the inroads of the barbarians on the eastern frontiers; but in the midst of these vast designs he was cut off by assassination on the Ides (15th) of March, B.C. 44. This crime was the greatest disaster that could have befallen the Roman world, as subsequent events showed. Of the 60 aristocrats who were in the conspiracy, many had partaken of C.'s generosity, and all of his clemency. A few, like Brutus, out of a weak and formal conscientiousness, based on theory rather than insight, were probably offended by C.'s desire to change the form of government into a hereditary monarchy; but the most, like Cassius, were inspired by a spleenful hatred of the dictator, and the base ambition of regaining power at all hazards.

C., who was 56 years of age when he was murdered, was of a noble and kingly presence, tall of stature, and possessing a countenance, which, though pale and thin with thought, was always animated by the light of his black eyes. He was bald-headed (at least in the latter part of his life), wore no beard, and though of a rather delicate constitution naturally, he ultimately attained the most vigorous health. His besetting sin was sensuality; but while no detraction can be permitted from the criminality of his conduct in this respect, it may yet be remembered that it was as much the sin of the times in which he lived as his own, and that the superlative grandeur of his position gave a prominence to his licentiousness which a more humble lot would have escaped. His intellect was marvellously versatile. In everything he excelled. He was not only the first general and statesman of his age, but he was—excepting Cicero—its greatest orator. As a historian, he has never been surpassed and rarely equalled in simplicity and vigor of style, and in the truthfulness with which he narrates events of which he was an eye-witness. He was, in addition, a mathematician, philologist, jurist, and architect, and always took great pleasure in literary society. Most of his writings have been lost, though their titles are preserved; but we still possess his invaluable *Commentarii* (generally known as 'Cæsar's Commentaries on the Gallic and Civil Wars'). The *editio princeps* was printed at Rome 1449. C.'s life was formally written in ancient times by Suetonius and Plutarch. There are modern lives by Delorme, Napoleon III. (1865), and J. A. Froude (1879).

CÆSAREA, *sĕs-a-rē'a* (*Turris Stratonis*), called by the natives 'Kaisari'yeh': once proud and splendid seaport, perhaps one of Herod's most magnificent works—a Grecian town with its temples, palaces, amphitheatre, baths, etc.,

imported into Syria—on the coast of Syria, 95 m. s. of Beyrout, and 37 m. n. of Jaffa.

In A.D. 65, Gessius Florus, the worst of all the petty tyrants that had afflicted Judæa, was appointed gov. of Cæsarea. About that time, a terrible revolution, which commenced at Cæsarea, broke out all over Judæa. It arose from a dispute between the Syrian and Jewish citizens of Cæsarea as to which of them the city really belonged to; and some idea may be formed of the extent of the insurrection from the fact, that above 20,000 Jews were massacred in Cæsarea in the space of one hour; 13,000 in one night at Scythopolis; 50,000 at Alexandria; 8,000 at Joppa; and 10,000 at Damascus.

Cæsarea was occupied by the Crusaders; after them; it seems, to have gradually decayed into nothingness. It is now a heap of half-buried ruins, with a few miserable stone houses inhabited by fishermen.

CÆSAREA PHILIPPI, *fĭ-lĭp'ī* (*Panium*): town about 20 m. n. of the Sea of Galilee; mentioned Matt. xvi. 13. It was distinguished from the Cæsarea on the coast of Syria by the appendage of 'Philippi,' given to it in honor of Philip the Tetrarch, who repaired the city. It is now a heap of ruins, overgrown with bushes and grass.

CÆSARIAN, or CÆSAREAN: see CESARIAN.

CÆSIUM, *sē'zĭ-ŭm:* a metallic element discovered in 1860 by Bunsen and Kirchhoff, in the form of the chloride, in a mineral spring at Dürkheim, Bavaria. The metal is widely disseminated, but is seldom found in any considerable quantity. It never occurs in the metallic state, but usually as the chloride or oxide, and commonly associated with the rare element rubidium. Its most important source is the mineral pollucite (q.v.), or pollux, which is found on the island of Elba and in the vicinity of Hebron, Me., and which contains as much as 36 per cent. of cæsium oxide, with no rubidium. Cæsium forms stable salts, and resembles potassium in its chemical properties. Metallic cæsium is best prepared by the electrolysis of a fused mixture of the cyanides of cæsium and barium, using aluminum electrodes. It is a silvery white metal, quite soft and ductile, and oxidizing rapidly upon exposure to air; chemical symbol Cs, specific gravity 1.88: atomic weight 133 (O = 16). The spectrum of cæsium is characterized by two blue lines from which circumstance it takes its name (cæsius, bluish-gray).

CÆSPITOSE: see CESPITOSE.

CÆSURA, n. *sĕ-zū'ră*, or CES- [L. *cæsūra*, cutting or hewing off—from *cæsus*, cut off]: in *verse*, the resting of the voice on a syllable; in *Latin verse*, the *cæsura* divides the verse or line into two parts; a syllable cut off at the end of a foot, or at the end or middle of a line. CÆSU'RAL, a. *-răl*, pertaining to.

CAF, or KAF, *kăf:* in Persian and Arabic legend, the mountain range that rims the world. 'From Kaf to Kaf' signifies from end to end of the earth.

CAFÈ, n. *kăf'fā* [*café*, coffee—from Ar. *kahveh* or *kawah*]: a coffee-house; a restaurant. CAFFE'IC, a. *-fē'ĭk*, of or pertaining to coffee. CAFETIÈRE, *kăf'tĭēr'* [F.]: the coffee-biggin, a large utensil for making coffee clear and strong. CAFFEINE, n. *kăf-fē'ĭn*, a bitter stimulating principle found in coffee, and also in tea: see COFFEE.

CAFFA: see KAFFA.

CAFFARELLI, FRANÇOIS MARIE AUGUSTE, *frân-swâ mâ-rē ô-gŭst kâf-fa-rĕl'lē*, French general: b. Falga Haute-Garonne, 1766, Oct. 7; d. 1849, Jan. 23. At the beginning of the revolution he was employed in the Sardinian army, but joined the army of the republic as a simple dragoon. In 1804 he was charged with the mission to Rome to induce the Pope to come to Paris to perform the ceremony of Napoleon's coronation, and on his return was made governor of the Tuileries. He was wounded at Austerlitz, accompanied Prince Eugene in Italy, and took part in the war in Spain. In 1814 he was chosen by Napoleon to conduct the empress and their son from Paris to Vienna.

CAFFEINE, *kăf'fē-ĭn*, an alkaloid occurring in the coffee bean, and having the formula $C_8H_{10}N_4O_2$. It is believed to be identical with the alkaloid theine, which occurs in tea, and also with guaranine (the alkaloid of guarana); and it is present in small amounts in cocoa. It may be prepared by adding basic acetate of lead to a strong decoction of coffee or tea which causes a precipitate of caffeotannate of lead. The excess of lead is removed by a stream of sulphuretted hydrogen, and the filtrate evaporated until the caffeine crystallizes out. When thus prepared caffeine consists of a mass of silky needles which contain more or less water. It is slightly soluble in water, alcohol, or ether. It has a bitter taste, and although it acts as a weak base its salts are decomposed by water. See COFFEE; TEA.

CAFFER BREAD, *kăf'fēr:* name of several species of *Encephalartos*, trees of the nat. ord. *Cycadaceæ* (*q.v.*), which, like many others of that order, have much starch in their stems, and afford food to the natives of s. Africa. They are called also bread-trees.

CAFFERS: see KAFIRS.

CAFFI, IPPOLITO, *ĭp-pŏ-lē'tō kâf'fē*, Italian artist: b. Belluno, 1814; d. near Lissa, 1866, July 20. He studied in Venice and excelled in matters of perspective and effects of light. Among his chief works are *Isthmus of Suez;* and *Carnival Scene on the Piazetta, Venice* (1855). He also painted the *Panorama of Rome.*

CAFFRA'RIA: see KAFFRARIA.

CAFFRE, n. *kăf'fr* [Ar. *kâfir,* infidel]: one of a powerful race or tribe in s. Africa; a tribe n. of Afghanistan: also KAFIR, and KAFFIR. See KAFIRS.

CAFFRISTAN: see KAFIRISTAN.

CAF'FYN, KATHLEEN MANNINGTON (HUNT) ('IOTA') English novelist: b: Waterloo House, County Tipperary, Ireland. She was trained as a hospital nurse, was married to Mannington Caffyn, a surgeon and author, and after his death began writing under the pseudonym of 'Iota.' Her first book, *A Yellow Aster* (1894), attracted much attention. It is a 'problem novel' and has been followed by *Children of Circumstances* (1895); *A Comedy in Spasms; A Quaker Grandmother* (1896); *Poor Max* (1898); *Anne Mauleverer* (1899); *The Minx* (1900); *The Happiness of Jill* (1901); *He for God Only* (1903); *Patricia: a Mother* (1905), etc.

CAFTAN, n. *kăf tăn* [Turk. *quaftân:* Russ. *kaftân:* F. *cafetan*]: a Persian or Turkish vest.

CAGAYAN SOOLOO, *kâ-ghī-ân' sô-lô':* island of the Asiatic archipelago, lat. 6° 58′ n., long. 118° 28′ e. It is about 20 m. in circumference, well wooded and elevated.

CAGAYAN is the name also of a province, river, and lake on the island of Luzon, one of the Philippines.

CAGE, n. *kāj* [F. *cage*—from L. *cavĕă,* a hollow place; a coop: Sp. *gavia:* It. *gabbia*]: a box for birds, generally made of wire-work; an inclosure for wild beasts; outer work of timber; the vessel for bringing up coals, etc., from pits: V. to shut up or confine. CA'GING, imp. CAGED, pp. *kājd.* CAGELING, *kaj'lĭng,* a caged bird.

CAGLIARI, *kâl'yâ-rē:* the southern province of Sardinia; 5,224 sq. m.; having four districts. It is a mountainous region, watered by several small streams; with mines of iron, silver, lead, and antimony, and salt works on the coast. Cattle, grain, and lumber are the other products. Pop. (1901) 483,548.

CAGLIARI, *kâl'yâ-rē:* cap. of the island of Sardinia, on the side of a hill, on the n.e. shore of a spacious bay, and on the s. coast of the island; lat. 39° 13′ n., long. 9° 8′ e. It has a spacious and safe harbor, defended by several forts, and is the emporium of all the trade of the island. The town contains many public buildings and churches, and has a university with 100 students; but its streets, for the most part, are narrow, steep, and dirty. Cagliari has a dockyard, and a good road was some years ago constructed from Cagliari to Sassari, the second city in the island, and to some of the more considerable places. Steamers ply very frequently between Cagliari and Genoa; and it is now in telegraphic connection with the continent. Pop. (1901) 53,747.

CAGLIARI, Paolo, best known as *Paolo Veronese:* 1532-1588, Apr. 19; b. Verona: Italian painter of great eminence. He first studied under his uncle, Antonio Badile, a respectable artist, and afterward settled in Venice, where he rapidly acquired wealth and reputation. He had for contemporaries Titian and Tintoretto, and was held in equal admiration with these famous painters. The church of San Sebastiano, Venice, contains many of his productions, which are reckoned the most important of his earlier period—i.e., the period before he visited Rome, when he first became acquainted with the masterpieces of Raphael and Michael Angelo. The influence of the Roman school on his style was so happy, that, on his return, he received the honor of knighthood from the doge. C. is remarkable for the fertility of his imagination. His design is generally noble, his composition rich, and his execution truthful. In the invention of details, especially, he is inexhaustible, and often overloads his pictures with ornament. One peculiarity of his works is the frequent introduction of splendid architectural backgrounds, which, however, were painted generally by his brother Benedetto. The most celebrated of his productions is the *Marriage Feast at Cana of Galilee,* now in the Louvre, Paris. It is 20 ft. high, and 30 in length, and contains 130 figures. Notable also are *The Calling of St. Andrew to the Apostleship, The Feast of Simon,* and the *Presentation of the Family of Darius to Alexander.*

CAGLIOSTRO, *kâl-yos'tro,* Count Alessandro di (true name, Giuseppe Balsamo): 1743, June 2—1795; b. Palermo, Italy, of poor parentage: notorious impostor, who travelled through Europe, and whose adventures afford considerable insight into the social characteristics of his times. Carlyle's picture of him when a boy—'brass-faced, vociferous, voracious'—is probably accurate, and already prophesies the bold and boisterous quack. When 13 years old he ran away from the seminary of St. Roch, and was afterward sent to a monastery at Cartagiore. Here he became assistant to the apothecary of the monastery, and picked up that scanty knowledge of chemistry and medicine, which in after years was made the basis of an enormous imposition. His conduct in the monastery was in keeping with his character, but finding it too contracted a sphere for the development of his ambitious genius, he left it, or was ejected, and for a time led 'the loosest life' in Palermo. When 26 years old, he found it highly advisable to leave his native place. In company with a certain sage named Althotas, C. is vaguely represented as travelling first in some parts of Greece, Egypt, and Asia. At Rome, 'his swart, squat figure first becomes authentically visible in the Corso and Campo Vaccino. He lodges at the sign of the Sun in the Rotunda, and sells etchings there,' very hard up at this time. In Venice, 'the bull-necked forger' contrived to marry a very pretty woman named Lorenza Feliciana, who became a skilful accomplice in his schemes, and captivated many admirers, while C. picked their pockets. C. now made the tour of Italy with great success as

a physician, philosopher, alchemist, freemason, and necromancer. Next, he extended his career through some parts of Germany, and especially carried on a lively business in his 'elixir of immortal youth,' which became very popular among the ladies. By virtue of this fine medicine, the count assured his patients that he had already attained his 150th year, while his young and charming wife often talked affectionately of her son as 'a commander in the Dutch navy.' Through Courland, the count and his accomplice advanced prosperously to the court of St. Petersburg, where he seems to have first made a failure; for the Empress Catharine, aided by her Scotch physician, Rogerson, a keen-witted native of Annandale, who skeptically examined his famous 'Spagiric food,' and pronounced it 'unfit for a dog,' penetrated his real character, and made him the subject of a comedy. C. soon found it convenient to vanish. He appears next at Warsaw, discoursing on his pet Egyptian masonry, medical philosophy, and the ignorance of doctors, but he had the misfortune to be unmasked by a certain Count M. This, however, had little effect on the stupid credulity of C.'s dupes—belonging, it must be remembered to the upper classes, who in that age, according to Carlyle, were at once sensual, infidel, and superstitious—so that they persisted for a time in 'distending his pockets with ducats and diamonds,' which, however, his lavish dissipation soon scattered to the winds—for this prophet of a new physical and moral regeneration, and inventor of an 'invaluable pentagon for abolishing original sin,' was a desperate gambler. In 1780 he went to Strasburg, and soon afterward was at Paris, still founding lodges of 'Egyptian freemasons,' holding nocturnal meetings for calling 'spirits from the vasty deep,' etc., and simulating the character and deeds of a philanthropist. From Paris he came over to England, where he was cordially received by the followers of Swedenborg. On his return to Paris (1785) he became distinguished at court, was intimate with the weak and credulous Cardinal Rohan, and played a prominent part in the affair of the Diamond Necklace (q.v.). This lodged him in the Bastile; but he cleared himself by a statement which gained credit, and, after being liberated, carried on his adventures once more in England, but feebly, his success now obviously diminishing, so that the count, in gloom and foreboding, disappeared from the island. But the market in Germany, too, was closed, a general distrust having been excited by the revelations of one of the count's dupes. Elsewhere, also, his dupes began to fail him. 'At Aix, in Savoy, there are baths, but no gudgeons in them;' at Turin, he is ordered off by the king; a similar fate befalls him at Roveredo; at Trent he is seen 'painting a new hieroglyphic screen,' which, however, attracts no more the gaping crowd; lower still, 'he pawns diamond buckles;' finally, his wayworn wife—in whom, perhaps, because of her womanhood, the enormous lie and quackery first breaks up—'longs to be in Rome by her mother's hearth, by her mother's grave. where so much as the

shadow of refuge awaits her.' In 1789, May, he entered the city; on Dec. 29 the Holy Inquisition detected him founding 'some feeble ghost of an Egyptian lodge.' He was imprisoned, and condemned to death for free-masonry. His sentence was commuted to imprisonment for life in the fortress San Leon, where, in spite of his 'elixir of immortal youth,' he died. His wife ended her days in a convent. His *Mémoires Authentiques*, posthumously circulated in Paris, were *not* authentic. See Carlyle's *Miscellaneous Essays*, art. Count Cagliostro.

CAGNOLA, *kân-yo'lâ*, Luigi Marchese: 1759–1833; b. Milan; of an ancient and wealthy family: Italian architect. His master-works are two triumphal arches. The first is the famous *Arco della Pace*, in Milan, commenced 1807, not finished until 1838. It is of white marble, and, with the exception of the *Arc de l'Etoile*, in Paris, is both the largest and noblest structure of the kind in Europe, reaching a height of 78 ft. On the top of the arch is a bronze figure of Peace, in a car drawn by six horses, while the sides are richly adorned with innumerable bas-reliefs. The second forming the *Porta di Marenga*, or *Porta Ticinense*, also is a work of great beauty. Besides these may be mentioned the *Campanile* (Bell-tower) at Urgnano, in the Bergamese.

CAGOTS, *kă-gō:* tribe of men, of manners and customs akin to those of the gipsies, scattered through various parts of Bearn and Gascony, in France. They are usually thought descendants of the Visigoths, who remained in France after their defeat by Clovis, in the 5th c. Until the French Revolution of 1790, they received even worse treatment than that which generally falls to the lot of the remnants of conquered races. They were forced to wear a peculiar dress, were forbidden to practice all but the most menial trades, and were obliged to live isolated, either in separate villages or in separate quarters of the town. So complete was their estrangement from the other inhabitants, that they were forced to enter the churches by doors specially set apart for them. Since that Revolution, they have been placed, as regards the law, on an equal footing with other citizens, but socially they are still regarded as a degraded race. Their language has been, so far back as is known, a corrupt dialect of that spoken in the surrounding country; but their blue eyes, fair hair, and fair complexion, mark them out as ethnologically distinct, and speak to a Teutonic origin. From a great liability to the diseases afflicting cretins, probably caused by their exposed manner of life and insufficient nourishment, they were at one time erroneously thought to belong to that unfortunate class. Tribes, whose history and present condition greatly resemble those of the C., are to be found in Brittany, where they receive the name of 'Caqueux;' and in Poitou, Maine, and Anjou, where they receive the name of 'Colliberts.' See Michel's *Histoire des Races Maudites de la France* (1847), the bulletins of the *Société Anthropologique* (1871, etc.), and the work by Rochas (1877).

CAHAN, *kâ'hăn,* Abraham, Russo-American journalist and novelist: b. Vilna, Russia, 1860, July 7. He came to the United States in 1882 and has edited several Yiddish periodicals in New York. He has written *Yekl, a Tale of the New York Ghetto; Raphael Narizokh,* in Yiddish; *The Chasm; The Imported Bridegroom and Other Stories; The White Terror and the Red* (1905).

CAHAWBA RIVER, *ka-haw'ba:* river of Ala. abt. 150 m. long. It rises in Jefferson co., flows s.w. and then s. through a coal region, and joins the Alabama river at Cahawba in Dallas co., 8 m. s.w. of Selma. It is navigable by small boats for 100 m.

CAHIR, *kăh'hẽr:* town in the county of Tipperary, Ireland, on the Suir, beautifully situated at the e. end of a valley between the Galtees and Knockmeledown Mountains, 8 m. n.w. of Clonmel. In the town is the seat of the Earl of Glengall, with a park which extends along the river for two miles below the town. Cahir Castle, an ancient irregular Norman structure of considerable extent, is on a rock on the left bank of the Suir. It was taken by the Earl of Essex, 1599, and by Cromwell, 1650; it has been lately restored. Cahir has extensive flour-mills, and there are large barracks near. Pop. about 3,000.

CAHORS, *kâ-ōr'* (anciently, *Divona*): town in the dept. Lot, France; on a small rocky peninsula, formed by a bend of the river Lot—here crossed by three bridges—about 65 m. n. of Toulouse. The streets of Cahors are steep and narrow, and present many specimens of antique architecture. It has a fine cathedral and several Roman remains, including those of a magnificent aqueduct. There is an obelisk to Fénelon, who was a student at the university here. The town was taken and pillaged by Henri of Navarre, 1580. It has manufactures of cotton-yarn, woolens, leather, paper, glass, etc.; the district produces wine in considerable quantities. Pop. 15,000.

CAICOS, *kī'kōsø* or Cayos, *kī'ōs,* or Keys [see Keys]: term applied to numberless rocky islets of the West Indies, generally with a reference to some more considerable island in the neighborhood. Thus, taking the Bahamas as an instance, there are the Keys of Providence, of Eleuthera, of Abaco, etc. But more specifically the name is often appropriated to the more southerly members of the group just mentioned—North, West, East, Grand, and other Keys together covering about 450 sq. m. They lie between 21° and 22° n. lat., having been transferred, with a local president, from the government of Bahama to that of Jamaica. Pop. abt. 5,000.

CAIFA, *kī'fa,* or Haifa, *hī'fa:* seaport on the coast of Syria, exactly opposite Acre, upon the spur of Mount Carmel, on the s. side of a wide semi-circular

bay, four miles across. It is the ancient Hefa, or Sycaminopolis. It covers but a small space of ground, and contains no edifice of any note except a few minarets The houses are of rough unhewn sandstone, plastered over with lime—the roofs flat. Pop. about 2,000—Moslems, Christians, and Jews. Caifa, having a better anchorage than Acre, is fast taking the place of that city as a port. Consular agents from England, France, etc., have, within 20 years, been established at Caifa; and there is a flourishing German settlement. Several cargoes of barley, wheat, and seasame seed are yearly shipped at Caifa, and exported to Great Britain and France. It is surrounded by beautiful gardens.

CAILLIÉ, *kâ-e-yā'*, René or Auguste: 1799, Sep. 19—1837, May 9; b. Mauzé, dept. of Deux-Sèvres: traveller. Having gone to Senegal, and engaged in trading with the natives, he learned, about 1826, that the Geographical Soc. of Paris had offered a premium of 10,000 francs to the first traveller who should reach Timbuktu. Provided with a stock of goods for barter, Caillié started from Sierra Leone, 1827, Mar. 22, and after some delay caused by illness, he reached the mysterious city, 1828, Apr., where he remained 14 days. On leaving Timbuktu, he accompanied a caravan across the Sahara desert, reaching the coast at Tangier. After hearing and examining his statements, the Soc. awarded to him the offered prize, with a pension of 1,000 francs, and the order of the Legion of Honor. His notes of travel, arranged by M. Jomard, were published under the title of *Journal d'un Voyage à Temboúktou et à Jenné dans l'Afrique Centrale,* etc. (3 vols., Par. 1830).

CAIMAN, or Cayman, n. *kā'măn* [name given by natives of Guiana]: the alligator or American crocodile.

CAIN, *kān:* first-born son of Adam and Eve. His history, in the book of Genesis, is mysterious, and the traditions which later superstition has gathered round it, have thrown no light on its perplexity. As the first murderer, his memory has always been profoundly execrated by the Christian Church; yet such is the perversity of human nature, that one sect—if not more—of the pseudo-Gnostics found his actions and character so much to their liking, that they called themselves *Cainites* (A.D. 130), and invented an explanation of his alleged crime, which, like most of the Gnostic heresies in the early church, sprang out of the deep-rooted fundamental error of the 'two principles.' The Cainites believed that Cain was the offspring of the intercourse of a superior Power with Eve, and Abel of an inferior Power; that their characters correspond to their paternal parentage, and that the slaying of Abel only symbolized the victory of the superior Power. The subsequent punishments of Cain were regarded as the persecutions of Abel's father—i. e., the Jewish God. For the same reason, they honored the reprobates

of the Old Testament—such as the people of Sodom, Esau, Korah, Dathan, and Abiram—whom they looked upon as the victims of the hatred of Jehovah. There are only distorted and fragmentary accounts of this, as of the other early heretical sects. The Cainites are also said to have denied the dogma of the resurrection of the body, to have rejected the New Testament, and accepted a gospel of Judas, the betrayer, whom also they reverenced for the singular reason that his crime, by procuring the death of Christ, secured the salvation of men.

CAIN-COLORED, a. *kān'kŭl-ẻrd* [*cane*, a strong reed; OE. *cane*, a kind of weasel: Gael. *cain*, of a yellow approaching to white]: in *OE.*, of a sickly yellow or straw-color; light-colored; red. *Note.*—Both the origin and sense of this term in *Shakespeare* are much disputed.

CAINE, Thomas Henry Hall: English novelist and dramatist: b. Runcorn, Cheshire, 14 May, 1853. He received his education in the Isle of Man and at Liverpool, and qualified as an architect, but abandoned architecture in order to become a journalist. He lived in London with Dante Gabriel Rossetti from 1881 till the latter's death in 1882, and in that year appeared his *Recollections of Rosetti.* He had previously published *Richard III.* and *Macbeth* (1877), a critical work, and *Sonnets of Three Centuries* (1882). In 1883 appeared his *Cobwebs of Criticism*, a review of the contemporary critiques of Wordsworth, Shelley, Byron, Keats, and other poets; and in 1887 he contributed to the Great Writers series a *Life of Coleridge.* His first novel was *The Shadow of a Crime* (1885), followed next year by *A Son of Hagar;* but *The Deemster* (1887), since dramatized (as *Ben-ma-Chree*), first brought him into prominent notice. His subsequent novels include *The Bondman* (1890), *The Scapegoat* (1891), *The Prophet* (1892), *The Manxman* (1894), *The Christian* (1897), *The Eternal City* (1901). Of *The Christian* nearly 100,000 copies were sold in England, and as many more in the United States, within the first year after publication. He has traveled in Morocco, Iceland, Russia, and North America, and acted in Canada as representative of the Society of Authors in negotiations concerning Canadian copyright.

ÇA IRA, *sâ ē-râ* [French for 'It will go on!']: refrain of the song beginning with—

'Ah, ça ira, ça ira, ça ira!
Les aristocrates à la lanterne!'

remembered as associated with the most terrible scenes of the French Revolution. Like the *Marseillaise*, the *Carmagnole* and the *Chant du Départ*, it became a French national song, and was styled the *Carillon National.* The melody, taken from another song, is said to have been a favorite air with the ill-fated Marie Antoinette.

CAIRD, n. *kärd* [Scot.]: a tinker, a gipsy.

CAIRD, Edward, Scottish philosopher: b. Greenock, 1835, March 28. He was educated at the Univ. of Glasgow; subsequently studied at Balliol Coll., Oxford; and became in 1864 fellow and tutor at Merton. In 1866, he became prof. of moral philosophy at Glasgow Univ.; and in 1893, master of Balliol, succeeding the famous Jowett. Among his works are a *Critical Account of the Philosophy of Kant* (1877); a brief book on *Hegel*, in Blackwood's 'Philosophical Classics'; *The Social Philosophy and Religion of Comte* (1885); and *Evolution of Religion* (1893); *The Evolution of Theology in the Greek Philosophers* (1901–2).

CAIRD, John: b. 1820; d. 1898; a distinguished Scotch philosopher and theologian, a student, and afterwards professor of Theology, at the University of Glasgow, of which he became principal in 1873. He exercised great influence in the direction of rendering theology more philosophical. His own philosophy was strongly affected by the German idealistic movement, and especially by the philosophy of Hegel. He published sermons, *Introduction to the Philosophy of Religion* (1880); and *Spinoza* (1888).

CAIRN, n. *kärn*, or Carn, *kârn* [Gael. and W. *carn*, a heap]: a heap of stones of conical form, frequently over an ancient place of sepulture; an artificial pile of stones. In its celtic sense of heap or pile, it appears in the names of hills and other natural objects in Scotland, Ireland, Wales, Cornwall, and Brittany. It is applied also to artificial heaps of unhewn stones.

There are several kinds of cairns. The simplest and most common form is a conical pile of stones of no great size. Next is what may be called the fenced or ringed cairn—a heap of stones girdled round by large unhewn stones set upright in the ground. Some cairns have two, and a very few have three such concentric girdles; in some instances, there are concentric rows of upright stones within the cairn. Many cairns are found in the neighborhood of the circles of unhewn stone pillars which antiquarians used to style 'Druidical.' In a few instances, cairns are found at the end of an avenue of standing stones. Some cairns are fenced round by a narrow ditch and a small earthen rampart. A very few cairns have unhewn flat stones on their tops; a still smaller number are surmounted by an unhewn stone pillar. A few are oblong in shape.

Cairns were erected for several purposes. It appears from record that they were often raised to distinguish the marches or boundaries of lands. One cairn near Balmoral, on the Highland Dee, is said to have been erected as a mustering-place for the men of Strathdee, who took its name, *Cairn-na-cuimhne*, or 'Cairn of Remembrance,' for their slogan or war-cry.

Many cairns are of considerable size. Each of three

cairns at Memsie, near Fraserburgh, Aberdeenshire, was about 300 ft. in circumference, and about 40 ft. high. A C. in the parish of Minnigaff, in Galloway, was 891 ft. in circumference. Several of the larger cairns are what is called 'chambered'—that is, have internal galleries or cells. Of three large ringed cairns at Clava, on the banks of the Nairn river, near the battlefield of Culloden, one was found to contain a gallery, about 2 ft. wide, leading from the s. side of the C. to a circular chamber in the centre, about 15 ft. in diameter, built of unhewn and uncemented stones, each course overlapping the other so as to meet at the top in that sort of rude dome which has received the name of the 'beehive house' (q.v.). The Boss C., on the moor of Dranandow, in the parish of Minnigaff, had two galleries crossing each other—each 80 ft. long, 4 ft. wide, and 3 ft. high.

Of all the 'chambered' cairns, the most remarkable is that at New Grange, on the banks of the Boyne, near Drogheda, Ireland. It is 400 paces in circumference, about 80 ft. high, and is supposed to contain 180,000 tons of stones. In 1699, it was described by Edward Llhwyd, Welsh antiquary, as, 'a mount or barrow, of very considerable height, encompassed with vast stones, pitched on end, round the bottom of it, and having another, lesser, standing on the top.' This last pillar has disappeared; of the outer ring of pillars, 10 still remain, placed at about 10 yards one from another. 'The cairn,' says Mr. Wakeman in his *Archæologia Hibernica* (Dublin, 1848), 'in its present ruinous condition, presents the appearance of a grassy hill partially wooded; but, upon examination, the coating of earth is found to be altogether superficial, and in several places the stones, of which the hill is entirely composed, are laid bare. The opening [nearly square, and lined by large flags] was accidentally discovered about 1699. The gallery, of which it is the external entrance, communicates with a [dome-roofed] chamber or cave nearly in the centre of the mound. This gallery, in length about 50 ft., is, at its entrance, 4 ft. high; in breadth about 3 ft. Toward the interior, its size gradually increases; and its height, where it forms the chamber, is 18 ft. The chamber is cruciform, the head and arms of the cross being formed by three recesses—each containing a basin of granite. The sides of these recesses are composed of immense blocks of stone, several of which bear a great variety of carving, supposed by some to be symbolical. The majority of these carvings must have been executed before the stones had been placed in their present positions. The length of the passage and chamber from n. to s. is 75 ft., and the breadth of the chamber from e. to w. 20 ft. Of the urns or basins in the recesses, that to the e. is the most remarkable. It is formed of a block of granite, and appears lo have been set upon, or rather within, another of somewhat larger dimensions.' The Irish antiquaries believe that the chambered C of New Grange —'the Cave of Achadh Aldai,' as it was called, from Aldai, the ancestor of the Tuatha De Danaan kings—was

opened and rifled by the Norsemen 862. About a mile from it, on either side, are other two cairns of nearly equal size, named Knowth and Dowth. The latter was opened 1847, and found to contain a gallery, a cruciform chamber, a basin or sarcophagus, and carved stones, all of the same type as those of New Grange. Engravings of the sculptures, in both cairns, are given in Mr. W. R. Wilde's *Boyne and Blackwater*, pp. 192–207 (Dublin, 1850), and some of them are obviously of the same character with sculptures found in Scandinavia; at Locmariaker, and at Gavr Innis, in the Morbihan, in Britanny; in one of the cells of a tumulus opened 1853 at Pickaquoy, near Kirkwall, in Orkney; among the ruins of an ancient fort at the Laws, near Dundee; at the ancient forts at Rowtin Lynn, and Old Bewick, in Northumberland; and on one of the standing stones near Penrith in Cumberland, called 'Long Meg and her Daughters.'

Cairns are most frequent in stony countries. Where, as in many parts of England, stones are scarce, the barrow or earthen mound came in place of the C., from which it differs only in the materials of which it is made. So also in Scandinavia. Cairns, or *dysser*, as they are there called, are rare in Denmark, but more common in Sweden and Norway.

CAIRNES, *kärnz*, JOHN ELLIOTT, LL.D.: 1824–75, July 8, b. Drogheda, Ireland: political economist. After some years in his father's counting-house, he entered Trinity College, Dublin; graduated 1848; was called to the Irish bar, and wrote for the press on social and economic questions. In 1856 he accepted the Dublin chair of political economy founded by his friend Abp. Whately; his first course of lectures was pub. 1857. In 1861 he passed to a similar position in Queen's College, Galway, and in 1866 to University College, London. His health became impaired 1865, and he withdrew from active duties 1872. He wrote much on gold for *Fraser's Magazine* and other periodicals, and published *The Slave Power* (1862); *Political Essays* (1873); *Essays in Political Economy* (1873); and *Some Leading Principles of Political Economy* (1874), his largest work. His writings are held to constitute the most important English contribution to economic science since J. S. Mill's *Principles*.

CAIRNGORM, n. *kärn'gawrm:* a brownish-yellow or amber-colored variety of quartz or rock-crystal, found at *Cairngorm*, Aberdeenshire, Scotland, and in other places, as at Olivet near Orleans, in Brazil, and in Siberia. In Cairngorm and the neighboring district of Mar, it occurs both in the granite rock and in the alluvial soil. It differs from common colorless quartz or rock-crystal only in the presence of a very little oxide of iron or manganese, to which it owes its color. It is much used as an ornamental stone. The yellow variety is frequently called topaz, though quite different from the true topaz, which it resembles chiefly in color, having neither its hardness nor its brilliancy. The topaz is, however, something found

BRIDGE OF GHEZIREH, CAIRO.

with it in the granite and gneiss districts of Mar and Cairngorm. The brown variety is sometimes called SMOKY QUARTZ, and when of a good and uniform color is by some preferred to the yellow.

CAIRO, *kār'ō:* town of Illinois, at the junction of the Ohio and Mississippi, the s. extremity of the state; cap. of Alexander co. It is the terminus of the Illinois Central railroad, which owned much of the land, and expended large sums, expecting the place to become a great centre of commerce. The ground being low, levees were erected and an embankment 80 ft. wide and 10 ft. high begun in 1857: in 1858 a flood nearly destroyed the town, but it was rebuilt and sufficiently protected. During the war it had importance as a depot of supplies and base of military and naval operations. Several thousand steamboats land there during the year; but its great advantages as a natural business centre are marred by an unhealthful climate. It has some manufactures, a custom-house of cut-stone which cost about $200,000, two banks, and several newspapers. Pop. (1910) 14,548.

CAIRO, *kī'rō* (Arabic, *Musr el Kahirah,* 'the victorious capital'): capital of modern Egypt; lat. 30° 2′ n., long. 31° 16′ e.; in a sandy plain between the right bank of the Nile and the ridge of Mokattam, and near the point of the delta of the Nile. From the foundation of the city, A.D. 969, the Fatimite caliphs of Africa, who brought the bones of their ancestors with them from Kairon, reigned for ten generations over the land of Egypt. The caliph Hakem, who built a mosque near Bab-el-Nassr, supposed founder of the Druse religion, was the third in this succession. In 1171, Saladin usurped the throne from the last of the Fatimites. His descendant, Moosa-el-Ashref, was deposed 1250; from that time till 1517, when the city was stormed and taken by Sultan Selim, C. was governed by a succession of Mameluke kings. C. was occupied by British troops 1882.

The city of C. occupies about three sq. m., and is surrounded by a low wall. Of late years it has been greatly improved. It is lighted with gas, and many fine broad streets have been opened through the crowded districts. The bazaars are well and richly supplied. The houses, which are generally two or three stories high, are built of variegated brick, with interlinings of wood, and have flat roofs. The city is divided into different quarters, one quarter being appropriated to the Turks, one to the Christians, one to the Jews, etc.; so that every religious sect has its own quarter, separated from the adjoining one by strong gates at the end of the streets; these are closed at night, and guarded by a porter, who opens the gate when any one wants to pass.

The most remarkable buildings in the city of C. are its minarets and mosques. The minarets are the most beautiful of any in the Levant, of a prodigious height, and built of alternate layers of red and white stone. The most ancient of all the minarets is that attached to the great

mosque of Sultan Tayloon. This mosque was built in the year of the Hegira 265 (A.D. 879), before the foundation of the city, and consists of an immense cloister or arcade on pointed arches, being the earliest extant in that form. Another magnificent mosque is that of the Sultan Hassan, in the place of the Roumayli, near the citadel; finished about 1362. It has two very elegant and high minarets, and the mosque, in consequence of its size, and the thickness of its walls, was frequently seized and made use of as a fortress by the insurgents in the numerous rebellions and insurrections under the rule of the Mameluke kings.

The population of C. consists of the ruling class, mostly Turks; Arabs, the former conquerors of the land, who form the bulk of the population, all the petty tradesmen and cultivators of the soil being of Arab origin; Copts, descended from the original lords of the land, the ancient Egyptians; Jews, Armenians, Syrians, Africans and Europeans. C. was occupied for a time by an English force after the battle of Tel-el-Kebir 1882; and suffered severely from cholera 1883. The Copts, a mere fraction of the population, built a handsome church 1867. Since 1863, the part of C. occupied by Europeans has been rebuilt in European style, with small regard for historical interest or harmony with surroundings.

Of objects worthy of note in the environs of C., are the tombs of the caliphs, about a mile beyond the walls—magnificent and imposing buildings, beautiful specimens of Arabian architecture. The mausoleum of Sultan Bergook is a gem of Saracenic architecture. The public gardens, which consist of groves of oranges, citron, palms, and vines, are very beautiful. The trade of C. is rapidly increasing. Exports consist mainly of native products, such as ivory, gum, wood, hides, ostrich feathers, cotton, and sugar; while imports are cotton and woolen goods, prints, hardware, cloth, furniture, shawls, indigo, sheep, tobacco, etc. The manufactures of C. embrace silk and cotton fabrics, gunpowder, glass lamps, sugar, sal ammoniac, weapons, and iron ware. C. is a great seat of learning, and popular education has recently advanced. The government college and the national schools are largely attended, while several thousand pupils attend the Moslem theological univ. attached to the mosque of Ezher. The schools comprise a commercial and juridical school at the Darb Algamâmîz, a school of arts and industry at Boolak (q.v.), and military schools at the Abbasseeyah. The language spoken at C. is Arabic. C. is the official residence of the khedive of Egypt, and has railway connection with Alexandria and Suez, and with Upper Egypt. Pop. (1897) 570,062.

CAISSE, n. *kās* [F. (see CAISSON)]: a case; a box; cash-box; money-chest: in *anat.*, the drum of the ear.

CAISSON, n. *kās'sŏn* or *kās-sûn'* [F. *caisson*—from *caisse*, a case, a chest—from Prov. *caissa*—from L. *capsa*, a chest or box]: in *military* matters, a wooden box filled with military stores; an ammunition-wagon; a large wooden chest

or frame loaded with powder, shells, etc., and buried under a fortification, to be blown up if the enemy take possession.

Caisson, in relation to shipping, is an apparatus for lifting a vessel out of the water for repairs or inspection; usually a hollow structure, sunk by letting water into it. There is an air-chamber inside, which allows it to sink only to a certain depth. In that state it is hauled under the ship's bottom, the traps or openings are closed, the water is pumped out, and the caisson rises with the ship upon it.

Caisson in engineering, is the water-tight box or casing used to permit of founding and building the piers of a bridge, quays, or other structures under water, when the water is too deep for a coffer-dam (q.v.). The caisson is frequently of cylindrical shape, open at bottom, those who work in it being supplied with air in the same way as divers in a diving-bell.

CAISSON DISEASE: workers in compressed air often suffer, on leaving the compressed air chamber for the outer air, from a number of disagreeable, and sometimes fatal, symptoms to which the term caisson disease has been given. Other names popularly applied to the disease are 'bends' and 'staggers.' The principal symptoms, some or all of which may be present in the individual case are: headache, dizziness, seeing double, paralysis, loss of the senses, pain over the stomach and vomiting, nosebleed, itching of the skin, and very severe neuralgia pains in various parts of the body. These symptoms do not occur if the decompression of air in the air-lock or chamber between the caisson and the exterior, is affected very gradually, and if the workmen remain in the air-lock a sufficient time to enable the tissues to readjust themselves to the lessened air pressure. The symptoms are also less liable to occur if the air in the caisson is frequently renewed. After emerging from the air-lock, the workers should rest for a while, putting on an overcoat to prevent chill, and should take a hot drink, such as tea, coffee, milk, or beeftea. If an attack occurs the sufferer should at once re-enter the air-lock and be subjected to renewed pressure until the pains disappear; then decompression should be performed with great deliberation. The nature of caisson disease has not been definitely determined, but it is believed that air bubbles in the small bloodvessels is one factor in the production of the distressing symptoms.

CAITHNESS, *kāth'ness:* northernmost county on the mainland of Scotland; length from n. to s., 40 m.; greatest breadth, 30 m.; 712 sq. m. Except in the w. and s., where the mountain-range dividing Caithness from Sutherland attains a height of more than 2,300 ft., the general aspect of Caithness is level and bare, being in great part moorland and destitute of trees,

while the sea coast is bold and rocky, with many bays, inlets, promontories, and caves. On the n. coast are Dunnet Head and Duncansby Head; and on the w. side of the last-named head is a spot of green turf, called John o' Groat's House, where John de Groot or Groat of Warse settled with his brothers in James IV.'s time, and built a house. There are no navigable rivers in Caithness, and no lakes of importance. The climate is damp and chilly, but snow rarely lies on the plains above a day or two at a time. There are no manufactures, properly so called, though weaving is carried on to some extent. The chief crops are oats, barley, turnips, and potatoes. The parts of the surface under tillage are generally a deep fertile loam on a strong till clay. In the n.e., the soil is sandy. There are herring, ling, cod, salmon, and lobster fisheries. The herring-fishery in July and August employs about 1,500 boats, some of which come from other parts of the Scotch coasts. Wick is the chief seat of the British herring-fishery. The average number of barrels cured annually in the ports of Caithness is abt. 200,000. Other exports are cattle, oats, and wool; also flagstones, of which, as well as of freestone and slate, Caithness contains quarries. Wick is the only parliamentary borough in Caithness; another town is Thurso, an old burgh of barony. The county returns one member to parliament, and Wick unites with Kirkwall, Dornock, Dingwall, Tain, and Cromarty, in returning another. A railway, completed 1874, and extending to Wick and Thurso, connects Caithness with the s. In early times, Caithness is supposed to have been inhabited by Celts; these afterward mixed with Danes and Norwegians. Caithness, in the middle ages, was subject to the kings of Norway. David II. adopted the weights and measures of Caithness for all Scotland. The Scandinavian origin or mixture of the people of Caithness is shown by their tall forms and soft, fair features, and their speaking English instead of Gaelic. Caithness has remains of Picts' houses, round towers, etc. Pop. (1901) 33,870.

CAITIFF, a *kā'tĭf* [F. *chétif*, poor, wretched—from OF. *chaitif* and *caitif*—from L. *captīvus*, a captive: in *mid. L.*, mean, poor-looking]: base; vile; wicked and mean: N. a mean, despicable person.

CAIUS, *kā'yŭs*, JOHN, M.D.: 1510–1573, July; b. Norwich, England: from whom Caius College, Cambridge, takes its name. His real name was Kaye or Key, which he Latinized into Caius. He was educated at Gonville Hall, Univ. of Cambridge; and at the age of 20, turned into English Chrysostom's *Method of Praying to God*, followed by a translation of Erasmus *On True Theology*. He next went abroad, and resided in Italy several years, studying medicine. On his return to England, he practiced with success at Cam-

bridge, Shrewsbury, and Norwich. Henry VIII. appointed him anatomical lecturer to the Company of Surgeons in London. In 1547, he was elected a fellow of the College of Physicians, of which he was subsequently made president. He also became physician to Edward VI., Queen Mary, and Queen Elizabeth. In the reign of the latter, an exciting controversy arose between the surgeons and physicians of London, as to the right of the former to administer internal remedies for the sciatica. Caius argued the negative so ably on behalf of the physicians that the decision was against the right of the surgeons to continue the practice of administering medicines. He was elected president of the college of physicians for seven years in succession. There is extant a book of the college annals from 1555 to 1572 written by him in Latin, the earliest account we have of the transactions of that college. He was dismissed from the royal service in 1568 on suspicion of favoring the Catholic party. He obtained permission to endow and raise Gonville Hall into a college, which still bears his name (Gonville and Caius College), and accepted the mastership thereof. The last days of his life were passed in the seclusion of his college. His principal work is, *A Boke or Counseill against the Disease commonly called the Sweate or Sweatyng Sickness. Anno Do.* 1552. Caius, however, wrote a great number of works on a variety of subjects, critical, antiquarian, and scientific.

CAIUS COLLEGE: see GONVILLE AND CAIUS COLLEGE.

CAIX, *kâ-ēks*, NAPOLEONE, Italian philologist: b. Bozzolo, near Mantua, 1845. His education was obtained at Cremona and Pisa, and in 1869 he was called to the chair of ancient languages in the Lyceum of Parma, becoming professor of Romanic languages and comparative philology in the Institute of Higher Studies in Florence in 1873. He has been a prolific writer and among his many works are *Saggio sulla storia della lingua e dei dialetti d' Italia* (1872); *Sulla lingua del Contrasto* (1876); *Le origini della lingua Poetica Italiana* (1880); etc.

CAJABAMBA, *kâ-ha-bâm-bâ*, Ecuador, capital of the province of Chimborazo, 102 miles south of Quito, on the arid plateau of Topi, at an elevation of 9,480 feet. The former town of Riobamba, founded on this site in 1533, was in 1797 overwhelmed by an earthquake in which 30,000 lives were lost. Population 16,000.

CAJAMAR'CA: the name of a department and city in Peru: see CAXAMARCA.

CAJATAM'BO: see CAXATAMBO.

CAJEPUT: see CAJUPUT.

CAJETAN, or GAETANI, BENEDETTO: see BONIFACE VIII.

CAJETAN, *kâj'e-tan* or *kâ'ye-tăn*, TOMMASO DE VIO: 1469, Feb. 20—1534, Aug. 9; named from his native town, Cajeta or Gaeta, Italy. He entered the Dominican order at 16; in 1508 became its general; defended Pope Julius II. at Pisa and Milan, and claimed for the pope exclusively the power of summoning councils; was made a cardinal 1517, and sent by Leo X. as legate to Germany, to induce the emperor Maximilian to join the league against the Turks, and to oppose the progress of the new doctrine. In this embassy his haughty manners still further estranged the reformers, and his demand that Luther should retract was not complied with. In 1519 he contributed to the election of Charles V. He became bp. of Gaeta and abp. of Palermo, was legate to Hungary when invaded by the Turks in 1523, and made prisoner and held to a ransom of 5,000 crowns when Rome was taken by the Imperialists in 1527. He died at Rome: his works were collected at Lyons, 1639.

CAJOLE, v. *kă-jōl'* [F. *cajoler*, to flatter—from OF. *cageoler*, to sing like a caged bird, or like a jay in a cage (see CAGE)]: to seduce by flattering words: to deceive by flattery; to coax. CAJO'LING, imp. CAJOLED', pp. *-jōld'*. CAJO'LER, n. one who. CAJO'LERY, n. *-lĕr-ĭ*, a coaxing; flattery.—SYN. of 'cajole': to coax; wheedle; flatter; deceive; delude; soothe; entrap.

CAJUPUT, n. *kā'yô-pŭt*, or CAJEPUT, *kăj'ĕ-pŭt* [Mal. *kayu-puti*, white wood], (*Melaleuca Cajeputi* or *M. minor*): tree of the nat. ord. *Myrtaceæ*, sub-order *Leptospermeæ*, from the leaves of which the pungent, aromatic, volatile oil, called *Oil of Cajuput*, is obtained by distillation. The C. tree is common on the mountains of the Moluccas. It is small, with a crooked trunk, thick spongy bark, white wood, elliptical-lanceolate alternate leaves, and terminal spikes of white flowers. The greater number of the species are natives of Australia, some of them very beautiful shrubs, ornaments of hot-houses. Much of the oil of C. of commerce is prepared in the island of Banda. It is said that two sackfuls of leaves yield scarcely three drachms of the oil, which is green, transparent, limpid, with a strong penetrating odor, agreeable only when much diffused.

CAKE, n. *kāk* [Sw. *kaka*, a cake or loaf: Dan. *kage:* Dut. *koeck:* Ger. *kuchen*]: a mass of dough baked of various shapes; thin flat pieces of oatmeal dough baked: a flattish mass of anything adhering or sticking together: V. to form into a flattish mass; to harden into a lump. CA'KING, imp. CAKED, pp. *kākt*, converted into a cake or crust. CAKING-COAL, the kinds of coal which cake or run together in the fire. MY CAKE IS DOUGH, I have been unsuccessful in my baking or undertaking; a failure. *Note.*—Skeat connects *cake* with L. *coq'uĕrĕ*, to cook.

CALABAR, *kăl-a-bâr':* a coast district of Upper Guinea, Africa, the limits of which are not clearly defined; but usually understood to extend between the river Benin and New Calabar, called by the Portuguese Rio del Rey, and

as far n. as the Kong Mountains. The surface is low and flat, and the climate unhealthful. Yams, the principal food of the inhabitants, are raised in plenty, also the sugar-cane, and palms, from which palm-oil is obtained in large quantities. The inhabitants are polygamists, and make human sacrifices to good and evil spirits. The United Presbyterians have had a mission here since 1846, which is beginning to produce beneficial changes.

CALABAR, New: river, a branch of the Niger, falling into the Bight of Biafra, lat 4° 30′ n., long 7° 7 e. It has a bar across its mouth, which prevents the entrance of vessels drawing more than 12 ft.; but some miles up it has an average depth of 30 ft.

CALABAR, Old: river of the dist. of Calabar, enters the Bight of Biafra, about 52 m. w.n.w. of Fernando Po., by an estuary about 9 m. wide. It is navigable by steamers for about 200 m. above its mouth, and abounds in crocodiles. The chief towns on its banks are—Duke Town, situated on its estuary; Creek Town, further up, both seats of British missions; Acoono Coono, and Omun.

CALABAR BEAN: remarkable medicinal agent, introduced into the new edition of the British Pharmacopœia (1867). It is the seed of *Physostigma venenosum*, a twining, half-shrubby plant, native of w. Africa, of the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*, nearly allied to the kidney bean, but of a genus distinguished by the hood-shaped stigma, and the deeply-furrowed hilum of the seed. The following are the leading characters of the bean itself: 'About the size of a very large horse-bean, with a very firm, hard, brittle, shining integument, of a brownish-red, pale chocolate, or ash-gray color. Irregularly kidney-shaped, with two flat sides, and a furrow running longitudinally along its convex margin, ending in an aperture near one end of the seed. Within the shell is a kernel, consisting of two cotyledons, weighing on an average about 46 grains, hard, white, and pulverizable, of a taste like that of the ordinary edible leguminous seeds, without bitterness, acrimony, or aromatic flavor. It yields its virtues to alcohol, and imperfectly to water.' It is used in the form of an emulsion by the natives of Africa, as an ordeal when persons are suspected of witchcraft. About 20 years ago, Dr. Christison very nearly fell a victim to his zeal for science in experimenting on some specimens of this bean which had been sent to Edinburgh by some African missionaries, dangerous symptoms having been produced by 12 grains of the kernel which he swallowed. In 1861, Dr. Thomas R. Fraser tried the effects upon himself of doses of 6, 8, and 10 grains. The general symptoms were epigastric uneasiness, great feebleness, dimness of vision, salivation, giddiness, and irregular, feeble, and slow heart's action. About the same time, he made the interesting discovery, that when placed on the eyeball this substance contracts the pupil, and produces near-sightedness; and it is now frequently employed for these purposes by ophthalmic surgeons. In 1864, 50 children were poisoned by eating these beans, which were swept out

of a ship at Liverpool, A boy aged six years, who ate six beans, died very soon. The chief symptoms in these cases were griping, vomiting, and contracted pupils; the face was pale, the eyes bright and protruding, and in trying to walk, the children staggered as if they were drunk. Dr. Fraser, in a paper which he communicated to the Royal Soc. of Edinburgh, 1866, maintains that, in mammals, death is generally produced by a combination of syncope (faintness) with asphyxia (suffocation); the symptoms of the one or the other depending on the dose, which, when large, at once destroys the heart's action. It has been used medicinally in small doses (one to ten grains of the powder, or $\frac{1}{16}$ to $\frac{1}{8}$ of a grain of the extract) in chorea, tetanus, general paralysis of the insane, and other diseases of the nervous system. Being now a recognized medicinal agent, it is satisfactory to know that the dangerous and even fatal effects of excessive doses may be prevented by administering belladonna (nightshade), or its active principle, atropia, as a counter-poison. This fact has been established by Dr. Fraser in a communication to the Royal Soc. of Edinburgh, embracing the results of 500 experiments on dogs and rabbits. So unmistakable is the power of the antidote, that it can prevent even three times a fatal dose of the kernel from causing death in those animals. Belladonna has also an opposite action on the eye to that of this substance, as it dilates the pupils and produces long-sightedness. When the pupil is contracted by Calabar bean, it may be dilated to its normal, or to a greater, size by belladonna; and when it is dilated by belladonna, it may be reduced to its normal, or to a less, size by Calabar bean.

CALABASH, n. *kăl'ă-băsh* [F. *calebasse*—from Sp. *calabaza*—from Ar. *garah*, a kind of gourd; *aibas*, dry]: a vessel or cup made of the shell of a gourd; a large fruit shaped

Calabash Tree.

like a pear. CALABASH-TREE (*Crescentia Cujete*), tree of the West Indies and the tropical parts of America, of the nat. ord. *Bignoniaceæ* (q.v.), suborder *Crescentiaceæ*. In height and size it resembles an apple-tree and has wedge-shaped leaves, large whitish fleshy flowers scattered over the trunk and older branches, and a gourd-like fruit, sometimes a foot in diameter. The wood of the tree is tough and flexible, and well adapted for coach-making. But the most useful part is the hard shell of the fruit, which, under the name of *calabash*, is much used in place of bottles for holding liquids, and for goblets, cups, water-cans, etc. These shells may even be used as kettles for boiling liquids, and they will bear this several times without being destroyed. They are sometimes highly polished, carved with figures, tinged with various colors, and converted into ornamental vessels. The rinds of gourds are sometimes similarly used, and called calabashes.

CALABOOSE, n. [Sp. *calabozo*]: a jail or lockup [U. S.].

CALABOZO, *kâ-lâ-bō'sō:* inland town of Venezuela, on the left bank of the river Guarico, 120 m. s.s.w. of Caracas; lat. 8° 55′ n., long. 67° 42′ w.; founded early in the 18th c. by a company. Bolivar defeated the Spanish Gen. Morales here, 1820. Calabozo is well built, has several fine churches, a college, 4 schools, but suffers from frequent floods and an average temperature of 88°. It is the centre of a cattle-raising country; there are hot springs near, and pools abounding in electrical eels. Pop. 6,000.

CALABRIA, *ka-lā'brĭ-a:* s.w. peninsula of the kingdom of Italy, bounded n. by the province of Basilicata. Its greatest length, from the s. border of Basilicata to Cape Spartivento, is about 160 m. In its n. part it has a breadth in some places of more than 60 m., which suddenly contracts, between the Gulfs and Sant' Eufemia and Squillace, to not more than 16 m.; area nearly 7,000 sq. m. It is traversed through its entire length by the Apennine Mountains (q.v.), whose summits in the region in the n. of Calabria, known as La Sila, and the Aspromonte, in the s., are crowned with pines, while forests of oak and beech cover their sides. The valleys between the various hills afford rich pasture, especially in the n., to which, in spring-time, whole colonies migrate with their flocks and herds. There is no river of any importance in Calabria; but the valleys and plains, watered by small streams are very fertile, yielding wheat, rice, cotton, licorice, saffron, the sugar-cane, etc.; also the vine, orange, lemon, olive, fig, and mulberry, in luxuriance. Iron, alabaster, marble, gypsum, and antimony, are among its minerals. The fisheries of its coasts, particularly the tunny and anchovy fisheries, are important, and afford employment to a large number of the population.

In ancient times the name C. was given to the s.e. peninsula, nearly corresponding to the modern province of Lecce, no portion of which is included in modern C., which answers to the ancient *Bruttium*. The name C., as applied to the district now known by that name, appears to have originated with the Byzantines some time prior to the conquest of the country by the Normans. A colony of the Vaudois or Waldenses of Piedmont was founded in C. 1340, and for some time enjoyed great prosperity, but was extirpated 1560–1. The destruction of this colony is one of the blackest passages of the history of religion in Italy.

The Calabrians are a proud, fiery, and revengeful race. They were long celebrated as among the fiercest of banditti; but the crimes which in former times made them infamous are no longer frequent. They strenuously resisted the power of France during the Napoleonic campaigns, and were not finally subdued until 1810. For purposes of administration, C. is divided into the provinces of Cosenza, pop. 465,267—cap. Cosenza; Catanzaro, pop. 476,-227—cap. Catanzaro; and Reggio, pop. 428,714—cap. Reggio. Total pop. of C. (1901) 1,370,208.

CALADIUM, n. *kă-lā′dĭ-ŭm* [perhaps Gr. *kalos*, beautiful: comp. Sp. *calado*, open work; *calados*, lace]: a genus of plants, ord. *Arācĕæ*, having a hood-like spathe rolled round at the base—varieties of several species have singularly spotted stems, and beautifully variegated foliage: see Cocco.

CALAHORRA, *kâ-lâ-ōr′râ:* town of Spain, province of Logroño, 24 m. s.e. of the city of Logroño; on the small river Cidacos, about 2 m. from its confluence with the Ebro. C. occupies the site of the ancient *Calagurris*, celebrated in classic history for the obstinate but unsuccessful resistance it offered (B.C. 78) to Afranius, Pompey's legate, when the citizens slaughtered their wives and children for food rather than surrender. C. was the birthplace of Quintilian the rhetorician. It has an old cathedral, and a trade in the agricultural produce of the rich district in which it is situated. Pop. about 8,000.

CALAIS, *kăl′ĭs:* a city and port of Washington co., Me., at the head of navigation on the St. Croix river; 28 m. n. by w. of Eastport, 75 m. e. by n. of Bangor, and 264 m. n.e. of Portland; the s.e. terminus of the St. Croix and Penobscot R.R.; is connected with St. Stephens, prov. of N. B., by 15 bridges. It was incorporated 1850, and in 1870, Aug., the most valuable section, with 15 wharves and 20 vessels was destroyed by fire. It has long been noted for its lumber and ship-building industries: for the first of which it has over 60 mills and 40 lath and shingle machines, with a productive capacity of 1,000,000 superficial feet of sawed lumber per day, and for the latter 10 ship-yards, an ample dry dock and two marine railways. C has a fine city hall, 16 schools, 10 churches, an academy, opera house, three machine shops, two foundries, four hotels, and two weekly newspapers. Pop. (1910) 6,116.

CALAIS, *kâ-lā':* seaport town of France, dept. of Pas-de-Calais, on the Strait of Dover, near its narrowest part, the distance from the town of Dover not being more than 26 m. There is here a lighthouse 190 ft. high. In 1879, it was determined to encircle C. with vast new fortifications, and make it once more a fortress of the first class. On the s. and e., low marshy grounds, which the authorities have the means of submerging, stretch up almost to the walls. The town, adjacent country, and port are commanded by the citadel, at the west end of the town, while numerous forts, by their cross-fire, defend the weakest points. The harbor, which is nearly dry at low tide, and rarely has more than 15–18 ft. of water, is formed by two moles, which project about three-quarters of a mile into the sea. Being one of the chief ports of debarkation for travellers from England to France, it has daily steam communication with Dover—with which it is also connected by submarine telegraph—and with London and Ramsgate several times a week. The drawbridge and gate by which, till 1883, the city was entered from the sea, was erected 1685 by Cardinal Richelieu, but has now been taken down; and the old ramparts and fosses were obliterated, as being a hindrance to communication between C. and its thriving suburb, St. Pierre de Calais (larger than C. itself). C. has few objects of interest, the most noticeable being the cathedral, with a fine picture of the *Assumption* by Vandyck. The chief manufactures are bobbinet (tulle) and hosiery. Numerous mills have been built; steam-engines are multiplying; and the inner ramparts have been removed to make room for factories. Hats and gloves are extensively made. It has also distilleries, salt-refineries, and ship-building. C. sends many boats to fish for herring and cod on the coasts of Scotland and Iceland. Water, which used to be scarce, is now brought in abundance from the neighborhood of Guines. Its exports consist of eggs, corn, wine, brandy, etc. In 1873, a school of artillery was established in Calais.

In the 9th c. C. was but a small fishing-village. In the following c. it was much improved by Baldwin IV., Count of Flanders, and enlarged and strengthened by Philippe of France, Count of Boulogne. After a long siege it was captured by Edward III, of England, whose hard terms, and the self-devotion shown by six of the citizens, who were saved by Queen Philippa, form one of the most interesting passages of history. The English retained it till 1558, when it was captured by the Duke of Guise, since which time (with the exception of two years, 1596–98, when it was in the possession of the Spaniards) it has been in French possession. In 1659, Charles II. of England resided some time here; and about a quarter of a century later, James II. arrived here with French troops for the invasion of England, which the destruction of the French fleet prevented him from accomplishing. Louis XVIII. landed here in 1814, after his exile. Pop. (1901) 59,743.

CALAMANCO, n. *kăl a-măn'kō* [L. *calamancus;* mod. Gr. *kamelaukion,* a head-covering of camel's hair]: a kind of woolen stuff made in the Netherlands, which has a fine

gloss, and is checkered in the warp, so that the checks are seen on one side only.

CALAMANDER WOOD, n. *kăl-ă-măn'dĕr* [corruption of *Coromandel*]: cabinet wood of the greatest value, resembling rosewood, but much surpassing it in beauty and durability. The tree which produces it is *Diospyros hirsuta* (see DIOSPYROS), a species of the same genus which produces ebony; it has oblong obtuse leaves, which are downy beneath, and flowers without stalks and crowded; and is a native of the s.e. of India, and of Ceylon, particularly of the forests at the base of Adam's Peak. But this tree 'has been so prodigally felled, first by the Dutch and afterward by the English, without any precautions for planting or production, that it has at last become exceedingly rare,' so that wood of considerable size is scarcely to be procured at any price. It yields veneers of unusual beauty, 'dark wavings and blotches, almost black, being gracefully disposed over a delicate fawn-colored ground. Its density is very great, a cubic foot weighing nearly 60 lbs., and it takes an exquisite polish.

CALAMARY, n. *kăl'ă-mā'rĭ* [mod. Gr. *kalamāri*, inkstand: L. *calamārĭŭs*, pertaining to a writing reed—from *calămus*, a reed-pen], known also as SQUID, or SLEEVE-FISH (*Loligo*): genus of cephalopodous mollusks of the order *Dibranchiata*, family *Teuthidæ*. The body is of elongated form, firm, fleshy, tapering, flanked toward its posterior extremity by two triangular fins. The body contains a *gladius*, or internal shell, which is horny and flexible, narrow and pen-shaped, with the shaft produced in front. The mouth is furnished with eight arms. Calamaries have the power of diffusing a dark-colored fluid around them in the water like the cuttle-fish. The different species are distributed over all parts of the world. In some seas, however, they so abound as to form the principal food of some of the larger fishes and of whales. The Common

Common Calamary (*Loligo Vulgaris*): *a*, gladius.

C. or Squid (*L. vulgaris*) is of a bluish color, speckled with purple. It grows to nearly a foot and a half in length, without reckoning the head and arms, which add to the length about half a foot more. See CEPHALOPODA.

CALAMIANES, *kă-lă-mĭ-ā'nēs*: group of islands in the Eastern archipelago, lat. about 11° 25′—12° 20′ n., long.

120° e. The largest of the group, named Calamianes, is about 35 m. long, and 15 m. broad, elevated and fertile, with abundance of animals, such as deer and hogs.

CALAMINE, n. *kăl'ă-mĭn* [L. *calamina*, cor. of L. *cadmia*, an impure ore of zinc]: zinc silicate: but the name has been confounded with zinc carbonate, which is smithsonite, chemically distinguished by Smithson 1803, and named after him 1832. The two occur together, and have outward resemblance, but calamine does not give the reaction for carbonic acid, except one 'carbonated' variety, found pisolitic in Spain. Calamine occurs in hemimorphic, rhombohedral crystals, usually white, with a vitreous lustre, a hardness of from 4.5 to 5, and a specific gravity of between 3.4 and 3.5. It also occurs in massive forms, sometimes mamillary in shape, and often cellular. In the United States calamine is found in New Jersey, Pennsylvaina, Virginia, Missouri, Utah, and Montana. In localities where it occurs pure and in quantity, it constitutes a valuable ore of zinc.

CALAMINT, n. *kăl'ă-mĭnt* [Gr. *kalos*, beautiful, excellent; *mintha*, mint], (*Calamintha*): genus of plants of the nat. ord. *Labiatæ*, nearly allied to Balm (q.v.) (*Melissa*). The Common Calamint (*C. Officinalis*, formerly *Melissa Calamintha*) has whorls of flowers (*verticillasters*), on forked, many-flowered stalks, and serrated leaves, with the agreeable aromatic odor of some kinds of mint. It is used by the country people to make herb tea, and as a pectoral medicine.—The Lesser Calamint (*C. Nepeta*), is used in the same way. Anciently, great medicinal virtues were ascribed to these wild plants—'excellent mints.'

CALAMITE, *kăl'a-mīt* [*see* Calamine]: genus of fossil plants whose true position has not been ascertained. They appear first in the Devonian rocks, and rise through the intermediate formations to the Oolitic series, where they are represented by a single species. They reach their culminating point in the Coal-measures, where 39 species have been determined. The tall, straight stems rose from a swampy clay soil in profusion in the forests of sigillaria, and formed a striking and characteristic feature in the coal flora, though they supplied little material for the structure of coal. They are hollow-jointed cylinders, with longitudinal furrows, giving the fossil the appearance of *Equiseta;* from this resemblance, botanists have generally considered them as huge 'horsetails.' Hooker has been unable to detect any trace of structure, in carefully prepared specimens, or the presence of those siliceous stomata which characterize *Equiseta*, and which would have been preserved in the fossil state, and Fleming has shown that the furrows are markings on the interior cavity. While, therefore, it is certain that they are not

'horsetails,' the absence of fructification makes every attempt to give them their position but guess-work. Hooker supposes them nearly allied to Ferns, or Club-Mosses; Brongniart ranks them among Gymnospermous Dicotyledons. The upper part of the stem, and the foliage, if any, have not been noticed. The root termination was conical, the joints decreasing downward in size and length. From the scars on the upper portion of each joint, there proceeded filaments, which were supposed to be leaves, but are really roots. These are shown in the species figured—a species common in the English coal-field.

CALAMITY, n. *kă-lăm'ĭ-tĭ* [F. *calamité*—from L. *calamĭtātem*, adversity]: a great misfortune or cause of misery. CALAM'ITOUS, a. *-tŭs*, producing distress and misery; full of misery. CALAM'ITOUSLY, ad. *-lĭ*. CALAM'ITOUSNESS, n.—SYN. of 'calamitous': deplorable; grievous; disastrous; adverse; sad; severe; miserable; distressful; wretched; baleful; unhappy;—of 'calamity': disaster; visitation; misfortune; mischance; mishap; misadventure; distress; affliction; adversity; unhappiness; misery, extremity; evil; downfall.

CALAMUS, n. *kăl'ă-mŭs* [L. *calămus*, a reed, a cane]: the sweet-flag growing in ponds, by the banks of rivers, and wet places in England and other parts of Europe, in the East Indies and America, used to flavor liquids, etc.; the *Acōrus călămus*, ord. *Arācĕæ*: see ACORUS: CALAMUS AROMATICUS.

CALAMUS, n. *kăl'ă-mŭs:* a rush; a reed anciently used as a pen to write with, or made into a musical instrument. The reeds, probably *Arundo Donax* (see REED), grew in marshy places. The best were obtained from Egypt. The stem was first softened, then dried, and cut and split with a knife (*scalprum librarium*) as quill pens are made. To this day the Orientals generally write with a reed, which the Arabs also call *Kalâm*. In *bot.*, the name C. is applied to a hollow, inarticulate stem. CAL'AMIF'EROUS, a. *-mĭf er-ŭs* [L. *fero*, I bear]: in *bot.*, producing reeds; reedy.

CALAMUS, *kăl'a-mŭs:* genus of palms: see RATTAN and DRAGON'S BLOOD.

CALAMUS AROMATICUS, *kăl'a-mŭs ăr-ō-măt'ĭ kŭs:* name given by the ancients to a plant to which they ascribed important medicinal virtues. It is not ascertained what the plant is: the most probable opinion appears to be that of Dr. Royle, who supposes it to be one of the sweet-scented grasses which yield the grass-oil (q.v.) of India, to which he has given the name of *Andropogon calamus aromaticus*. See LEMON-GRASS. The C. A. of the Greeks and Romans came from the East. The *Sweet Calamus* and *Sweet Cane* mentioned in Scripture (Exod. xxx. 23, and Jer. vi. 20) are probably the same with the calamus aromaticus.

CALAMY, *kăl'ŭ-mĭ*, EDMUND: 1600-1666, Oct. 29; b. London: Presb. clergyman. He studied at Pembroke

Hall, Cambridge, where he attached himself to the Calvinistic party; and afterward became domestic chaplain to the Bp. of Ely. In 1626, he was appointed lecturer at Bury St. Edmunds, but resigned his office when the order to read the *Book of Sports* began to be enforced. In 1639, he was chosen minister of St. Mary's Aldermanbury, London. He now entered warmly into the controversies of the time, and became noted as a leading man on the side of the Presbyterians. He had a principal share in the composition of *Smectymnus,* a work intended as a reply to Bishop Hall's *Divine Right of Episcopacy,* and one of the most able and popular polemics of the day. Like most of the Presbyterian clergy, he was monarchical and not republican in his political opinions. He disapproved, therefore, the execution of King Charles, and of the protectorate of Cromwell, and did not hesitate to avow his attachment to the royal cause. He was one of the deputies appointed to meet Charles II. in Holland, and congratulate him on his restoration. His services were recognized by the offer of a bishopric, which he refused from conscientious scruples. The increasing tyranny and intolerance of the High Church party compelled him to give up even his royal chaplaincy.

Two of his sons were educated for a religious profession: one, Dr. Benjamin C., became a High Churchman, and wrote *A Discourse against a Scrupulous Conscience;* the other, Edmund C., was ejected for nonconformity, and had a son, also named Edmund, who acquired some reputation as the biographer of the ejected clergy.

CALANDO, *ka-lăn'do,* in Music: Italian expression, meaning diminishing by degrees from forte to piano; it differs from decrescendo or diminuendo, as the tempo, at the same time, is slightly retarded, though not so much as in ritardando. The proper performance of the C. is purely a matter of good taste and feeling, depending on the performer.

CALAN'DRA: see Corn Weevil.

CALANDRONE, *ka-lăn'drōn:* wind instrument of music, used by the Italian peasants, for simple melodies, and sometimes for accompanying their national songs. It has the holes of the common flute, but the intonation is produced as in the common pipe.

CALANGAY, *ka-lăn'gā:* a species of white parrot.

CALAS, *kâ-lâs'* or *kâ-lâ',* Jean: 1698, Mar. 19—1762, Mar. 9; b. Lacaparède, in Languedoc, France. He lived as a tradesman in Toulouse, where he had a very good reputation. One evening after supper (1761, Oct. 13) the eldest son of the C. family, Marc Antoine, a youth addicted to gambling, and subject to fits of deep melancholy, was found hanged in the warehouse. There was not a shadow of a reason for any other theory of his death than that of suicide; but popular rumor accused the father, or other members of the family, of murdering the eldest son, 'because he had contemplated conversion to Rom. Catholicism.' It was also asserted that a young man named

Lavaysse, who was in the house on the fatal evening, had been despatched 'by the Protestants of Guyenne to perpetrate the murder.' The clergy exerted their influence to confirm the populace in their delusion. At Toulouse the White Penitents celebrated with great solemnity the funeral of the young man, and the Dominican monks erected a scaffold and placed upon it a skeleton, holding in one hand a wreath of palms, and in the other an abjuration of Protestantism. The family of C. was brought to trial for the murder, and several deluded and (probably) some bribed witnesses appeared against them. A Rom. Cath. servant-maid, and the young man Lavaysse, were also implicated in the accusation. C., in his defense, insisted on his uniform kindness to all his children; reminded the court that he had not only allowed another of his sons to become a Rom. Cath., but had also paid an annual sum for his maintenance since his conversion. He also argued from his own infirmity that he could not have prevailed over a strong young man, and referred to the well-known melancholy moods of the deceased as likely to lead to suicide; and, lastly, he pointed out the improbability that the Rom. Cath. servant-maid would assist in such a murder. But all his arguments proved unavailing, and the parliament of Toulouse sentenced the wretched man—by a majority of eight votes against five—to torture and death on the wheel. With great firmness and protestations of innocence to the last, the old man died on the wheel. His property was confiscated. His youngest son was banished for life from France, but was captured by the monks, and compelled to abjure Protestantism. The daughters were sent to a convent. The young man Lavaysse was acquitted, and the widow of C. escaped into Switzerland, where she was so fortunate as to excite the benevolent interest of Voltaire, who brought the whole affair before the public, and, in his book *Sur la Tolérance*, proved that C. had fallen a victim to religious hatred and popular fanaticism. A revision of the trial followed, and, after full investigation, the parliament at Paris declared (1765, Mar. 9), C. and all his family innocent. Louis XV. gave to the bereaved family the sum of 30,000 livres; but, neither the parliament of Toulouse nor the fanatical monks were ever brought to account for this judicial murder.

CALASA'YA BARK: see CINCHONA.

CALASCIBETTA, *kâ-lâ-she-bĕt'tâ*, or CALATAS-CIBETTA, *kâ-lâ'tâ she-bĕt'tâ* [Saracenic = Castle of Xibeth or Scibet]: town of Sicily, near its centre, 54 m. s. e., of Palermo, province of Caltanisetta. The town is mean and dismal looking, and is built on a steep and isolated height, the summit of which is 2,570 ft. above the sea, and commands a magnificent view. It was founded 1080. The only notable object is the tower of the principal church, of early architecture. Pop. 6,600.

CALASH, n. *kă-lăsh'* [F. *calèche:* It. *calessa:* Sp. *calesa* —from Pol. *kolaska*, a common cart—from *kolo*, a circle or

wheel]: a light carriage with low wheels; a hooded carriage; a lady's hood.

CALASIA'O: town of the island of Luzon (Philippines). The people are engaged in the manufacture of straw-hats, cigar-cases, etc. Pop. 18,000.

CALASPARRA, *kâ-lâs-pâr'râ:* town of Spain, province of Murcia, 40 m. n.w., of the city of Murcia. The inhabitants are chiefly engaged in agricultural pursuits. Pop. 5,275.

CALATABELLOTA, *kâ-lâ'tâ-bĕl-lō'tâ:* town of Sicily, province of Girgenti, 27 m. n.w. of the city of Girgenti. In the immediate vicinity is the site of the ancient *Triocala*, chief fortress of the insurgents in the second Servile war B.C. 103–100. Pop. about 6,000.

CALATAFIMI, *kâ-lâ'tâ-fē'mē:* town of Sicily, province of Trapani, 8 m. s.w., of Alcamo, in a very fertile district. It is ill-built, and has a ruinous old Saracenic castle, Kalat-al-Fimi, from which it derives its name. There is a remarkable Mosaic altar in the church of Santa Croce. Here, 1860, Garibaldi's troops defeated the Neapolitan soldiers. Pop. 9,500.

CALATAGIRONE, *kâ-lâ'tâ-jē-rō'nā,* or CALTAGIRONE, *kâl-tâ-jē-rō'nā:* city of Sicily, province of Catania, 34 m. s.w. of the city Catania. It is well built, with wide streets, and has the fame of great wealth. It has manufactures of cotton fabrics and pottery. Pop. 28,119.

CALATANAZOR, *kâ-lâ-tâ-nâ-thōr'*: town of Aragon, Spain, about 10 m. s.w., of Soria; notable for a great victory over the Christians obtained by Al-Mansur 1001. Pop. 1,500,

CALATAYUD, *kâ-lâ-tâ-yôd':* city of Aragon, Spain; on the Jalon, near its junction with the Jiloca, about 48 m. s.w., of Saragossa. It is built at the base of two rocky ridges, and out of the ruins of ancient *Bilbilis,* which lay about 2 m. to the east. The city is divided into a new and old portion, the former composed of mean old buildings. The latter has some good streets and handsome squares. C. has a noble old castle, and among its other noteworthy public edifices are the two collegiate churches and the Dominican convent. In the neighborhood are curious stalactitical caves. It has manufactures of linen and hempen fabrics, woolens, paper, leather, etc., and a trade in agricultural produce. Pop. 11,537.

CALATHIFORM, a. *kă-lăth'ĭ-fawrm* [L. *cal'ăthus,* a basket; *forma,* shape]: in *bot.,* hemispherical or concave, like a bowl or cup.

CALATRAVA, *kâ-lâ-trâ'vâ:* an order of knighthood in Spain, instituted at Calatrava la Viega (q.v.). The statutes of the order, framed by the chapter-general of the Cistercian monks, were sanctioned by the Bishop of Toledo, 1164, and afterward by the pope. At subsequent periods, many privileges were added. After the death of the king, their patron, some of the knights were no longer willing to obey the abbot, and they consequently separated them

selves from the monks, and elected a grand-master, Don Garcias de Redon At a later period, they again united themselves to the Cistercians, after they had gained rich possessions from the Moors both in Spain and Portugal. When Castile had fallen into anarchy, and the other kingdoms were exhausting themselves by internal feuds, the war against the unbelievers was almost entirely carried on by the knights of C. Their almost uniform success, however, gave rise to rashness ; the knights were defeated by Emir Jacob ben Yuseff ; nearly all of them perished, and Calatrava was occupied by the Moors. After this disaster, the knights transferred their seat to the Castle of Salvatierra, by the name of which they were long known. A truce of 12 years having been concluded, during which the order revived, the knights were able, at the battle of Las Navas de Tolosa, 1212, to turn the tide in favor of the Christians. They then returned to Calatrava. Notwithstanding their splendid achievements, the knights of C. never possessed the vast wealth of their brethren of St. James of Compostella (q.v.), a fact probably accounted for by their having ceded a part of their conquests to the orders of Alcantara and Aviz. But their grand-masters, who were chosen from the highest families in Spain, were very powerful, and exercised vast influence on public affairs. They did not, however, escape the jealousy of the crown. Two of them were accused of treason, and died on the scaffold ; and on the death of the 13th grand-master 1489, the administration of the order was transferred to the king by a bull of Pope Innocent VIII. By way of compensation for the loss of their independence, the knights were permitted to marry once, though they were still bound to make vows of poverty, obedience, and conjugal chastity ; and latterly to profess belief in the immaculate conception. Their original costume consisted of a coat of white mail, with a white scapulary, a black cap, and a pilgrim's hood ; but this dress the Anti-pope Benedict XIII., 1397, granted them permission to exchange for a civil apparel. Their present costume is a white mantle,

Red Cross of Knights of Calatrava.

with a red cross cut out in the form of lilies upon the left breast ; while the cross of the order has the same symbol

on a silver ground. Two convents for nuns were attached to the order, and were at one time richly endowed. The nuns, attached to the order of C. in 1519, wore the dress of Cistercian nuns, with the cross of the order on the left side of the capoch, fastened to the scapulary.

CALATRAVA LA VIEGA, *kâ-lâ-trâ'vâ lâ ve-ā'hâ:* ruined city of Spain, on the Guadiana, about 12 m. n.e. of Ciudad Real. In the middle ages it was a strongly fortified place, but nothing now remains but a single tower. Its defense against the Moors, undertaken by Raymond, abbot of Fitero, and Diego Velasquez 1158, after it had been abandoned by the Templars, is famous on account of its having originated the order of the Knights of Calatrava, long one of the most honorable in Spain. The town was called C. la Viega, or Old Calatrava, in order to distinguish it from the convent of the knights of the order of Calatrava, erected in the neighborhood, 1214, called Calatrava la Nueva.

CALBURGA *kăl-bĕr'ga:* town of the Nizam's dominions in Hindustan, about 110 m. w. of Hyderabad; on a tributary of the Beemah, itself a tributary of the Kistna or Krishna. It has been successively the capital of Hindu and Mohammedan sovereignties.

CALCAIRE GROSSIER, *kăl-kār grō-sĭ ā* [F., coarse limestone]: French representative of the Bracklesham Eocene beds. It consists of compact limestones with seams of chert, and intercalated marls and freestones. The fossils are fresh water and marine mollusca, so abundant that in one spot near Grignon no less than 400 distinct species have been procured. Associated with the fresh-water remains are the bones of reptiles and mammalia.

CALCAIRE SILICEUX, *kăl-kār sĭ-lĭ-sĕh* [F., siliceous limestone]: French representative of the Bembridge Eocene strata. These compact siliceous limestones extend over a wide area in the Paris basin. Their few fossils are fresh water and land shells.

CALCANEUM, n. *kăl-kā'nē-ŭm* [L. *calcānĕum*, the heel]: in *anat.*, the great bone of the heel. CALCA'NEAL, a. *-nē-ăl*, pertaining to.

CALCAR, n. *kăl'kâr* [L. *calcar*, a spur]: in *bot.*, a projecting hollow or solid process from the base of an organ; the spur of rasorial birds; the rudiments of hind limbs of certain snakes. CAL'CARATE, a. *-āt*, having a spur, or like one; spurred.

CALCAR, n. *kăl'kâr* [mid. L. *calcārĭă*, a lime furnace or kiln—from *calx*, lime; *calcārĭŭs*, pertaining to lime]: the furnace in which the first calcination of sand and potashes for making glass is effected. CALCAREOUS, a. *kăl-kā'rĭ-ŭs*, having the qualities of lime; containing lime; composed of the carbonate of lime. CALCA'REOUSNESS, n. CALCAREOUS TUFA, a loose and friable variety of carbonate of lime. CAL'CARIF'EROUS, a. *-kă-rĭf'ĕr-ŭs* [L. *fero*, I bear]: lime-yielding.

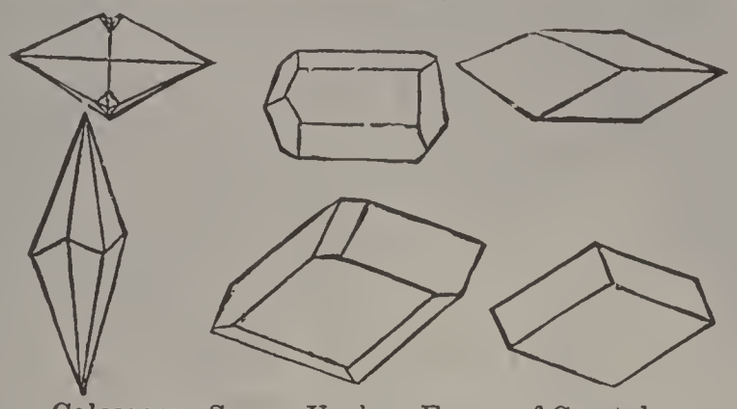
CALCAR, *kâl'kâr*, or KALCKERM, *kâl'kĕrm*, JAN VAN: 1499–1546; b. Calcar, in the duchy of Cleves; painter.

His studies were completed at Venice under Titian, whose manner, as also that of Raphael, he followed so closely that his works have sometimes been confounded with theirs. He drew the figures for Vesalius's anatomical work, and nearly all the portraits in Vasari's *Lives*. One of his best pictures is the *Mater Dolorosa*, at Stuttgart. His *Nativity*, in which the light appears to proceed from the infant Jesus, was a favorite of Rubens, and afterward purchased by the Emperor Ferdinand. The Louvre has one of his portraits. He died at Naples.

CALCAREOUS, *kăl-kā'rĭ-ŭs*, in Chemistry: term applied to substances containing much lime. Thus, *C. waters* are those which hold in solution much carbonate and sulphate of lime, and which are generally known as hard waters, and form a deposit in kettles and other vessels when heated therein.—*C. rocks* are those in which lime is the prevailing element. They may be chemically formed, as in the case of tufas; where a saturated solution of carbonate of lime in water is deposited from evaporation or other causes; but they are generally aqueous rocks, the materials of which are supplied by animal remains. Thus, many rocks, like the mountain-limestone, are composed of shells, corals, and encrinites; while others, like chalk, consist of foraminifera and fragments of other minute testacea. A crystalline structure, varying in degree from the partially crystallized carboniferous limestones to the saccharine statuary marble, is produced in calcareous rocks by metamorphic action. Oolite is a variety of limestone composed of small egg-like grains resembling the roe of fish. The existence of lime in rocks can always be detected by the application of dilute nitric or muriatic acid, when it effervesces from the liberation of the carbonic acid. Pure lime is obtained from calcareous rocks by calcining them—i. e., by driving off the carbonic acid and other volatile matter by heat.—*C. soils* are produced from the disintegration of calcareous rocks. When the rocks are perfectly pure, they generally yield barren soils, as in many chalk and limestone districts of Britain; but when the lime is mixed with clay, so as to form marl, and has a little vegetable matter added, it forms an excellent though rather light soil. Calcareous soils are difficult of drainage, owing to the property that soft lime has of retaining water, though it easily yields it up by evaporation. Such soils are consequently soon dry at the surface after rain, yet rarely suffer severely from drought.—*C. springs* are springs charged with calcareous matter (see CALCAREOUS TUFA), which is deposited from the waters in form of incrustations.

CALCAREOUS SPAR, or CALC-SPAR, *kălk'spâr:* carbonate of lime, rhombohedral in its crystallization. It differs from arragonite only in crystallization: see ARRAGONITE. C. S. occurs in all geological formations, and is one of the most abundant of minerals. It often completely fills cavities in rocks; and although it has been prevented by want of space from assuming a crystalline form, is readily divided by the knife and hammer into rhomboids, the primary form of its crystals being a rhomboid, of which

the greatest angles are 105° 5′. Its secondary forms are more numerous than those of any other mineral. More



Calcareous Spar.—Various Forms of Crystals.

than 700 have been observed. One of the most common, a rather elongated pyramid, is sometimes called *Dog-tooth Spar*. C. S. is colorless and transparent, except from casual impurity; and when perfectly transparent, it has in high degree the property of double refraction of light, discovered in it by Bartholinus. The presence of foreign substances frequently renders C. S. gray, blue, green, yellow, red, brown, or even black.

The name *Iceland Spar* has often been given to C. S., at least to the finest colourless and transparent variety, because in Iceland it is found massive in trap-rock. *Slate Spar* is a lamellar variety, often with a shining, pearly lustre, and a greasy feel.

CALCAREOUS TUFA, *tū′fa*, or CALC-TUFF, *kălk′tŭf*, or TUFACEOUS LIMESTONE: mineral deposit, frequent near calcareous springs; in chemical composition, nearly identical with limestone and marble, but distinguished by its spongy and cellular structure. It is generally rather soft, brittle, and friable, especially when freshly quarried; afterward some varieties of it solidify and harden, and are useful as building stone. The *travertino*, used for building at Rome, is a hard calcareous tufa. The temples at Pæstum are of C. T., which has now acquired great strength. The color of C. T. is generally yellowish-gray, sometimes yellow or yellowish-brown. It occurs massive, or assumes many uncrystalline forms, as tubular, botryoidal (like clusters of grapes), cellular, etc. Sometimes it incrusts animal and vegetable remains. It is sometimes used as a filtering stone. At Clermont, France, a calcareous spring has deposited a block of C. T., 240 ft. long, 16 ft. high, 12 ft. wide.

CALCEDONY, n. *kăl-sĕd′ŏ-nĭ* [from *Chalcēdon* in Bithynia on the Propontis]: a non-crystalline mineral of the quartz family, closely allied to the opal and agate—also written CHALCEDONY (q.v.). CALCED′ONYX, n. *-nĭks*, varieties of agates of an opaque white color, alternating with translucent grayish.

CALCEOLA, n. *kăl-sē′ŏ-lă* [L. *calcĕŏlus*, a small shoe]: in *geol.*, a fossil coral of the Devonian period having an operculum of a single valve or piece, formerly thought to be a brachiopod.

CALCEOLARIA, n. *kăl'sĭ-ō-lā'rĭ-a* [L. *calcĕŏlārĭŭs*, a shoemaker—from *calcĕŏlus*, a small shoe]: genus of plants of the nat. ord. *Scrophulariaceæ* (q.v.), of which there are numerous species, natives of S. America, chiefly of the part of the Andes more than 9,600 ft. above the sea, a few of them reaching almost to the limits of vegetation; though some are found in the lower and warmer situations, and some in the s. extremity of the American continent. They abound so much in some parts of Chili and Peru as to give a peculiar aspect to the landscape. The calyx in this genus is 4-partite; the corolla, 2-lipped; the lower lip remarkably inflated, so as to form a bag, and the shape of the whole in some species considerably resembling that of a slipper. There are only two fertile stamens, and the capsule is semi-bivalvular with bifid valves. Some of the species are shrubby, some herbaceous, almost all the herbaceous species being perennial. Many of them have corymbs of numerous showy flowers. Yellow is the color which chiefly prevails in the flowers of the original species, and next to it purple; but the art of the gardener has succeeded in producing varieties and hybrids with many other rich and relicate tints. Some of the species are used in South America for dyeing. The roots of *C. arachnoidea*, parent of many of the hybrids common in America and Europe, are largely used in Chili, under the name of *Relbum*, for dyeing woolen cloths crimson. CALCEOLATE, a. *kăl-sē'ō-lāt*, having the form of a slipper; applied also to the hollow petals of orchids.

CALCIFORM, a. [L. *calsc*, heel and form]: like a heel.

CALCIFY, v. *kăl'sĭ-fī* [L. *calcem*, lime; *fīō*, I become]: to convert into lime. CAL'CIFYING, imp. CALCIFIED, pp. *kăl'sĭ-fīd*, converted into lime; characterized by lime. CALCIFICATION, n. *kăl'sĭ-fĭ-kā'shŭn*, conversion or change into lime; see CALCINE.

CALCIMINE, n. *kăl'sĭ-mīn* [L. *calx*, lime]: a superior kind of white or colored wash for walls. V. to apply this wash. Spelled also calsi-, calso-, kolsomine.

CALCINE, v. *kăl-sīn'* or *kăl'sĭn* [F. *calciner*, to calcine—from It. *calcīna*, lime—from L. *calcem*, lime]: to treat a substance like lime—that is, to burn it as in a kiln; to reduce to cinders or ashes by means of heat; to reduce a substance by heat to a state of powder or ashes. CAL'CINING, imp. CAL'CINED, pp. *-sīnd*. CALCIN'ABLE, a. *-ă-bl*. CAL'CINA'TION, n. the act of reducing to cinders or ashes by heat; the process of reducing any ore or mineral to a calx by heat, essentially a process of oxidation (see CALX). CALCIF'EROUS, a. *-sĭf'ēr-ŭs* [L. *fero*, I produce]: containing lime. CAL'CIFORM, a. *-sĭ-fawrm* [L. *forma*, a shape]:

CALCEOLARIA.

in the form of calx or lime. CAL'CITE, n. *-sīt*, a crystallized variety of carbonate of lime.

CALCIUM, n. *kăl'sĭ-ŭm* [L. *calcem*, lime]: an elementary body, the metallic base of calx or lime. CALCIC, a. *kăl'sĭk*, pertaining to calx or lime; denoting the presence of calcium. HYDRATE OF CALCIUM or CALCIC HYDRATE, slaked lime. CALCIC SULPHATE, gypsum. CALCIC PHOSPHATE, bone phosphate, or phosphate of lime.

CAL'CIUM, a metallic element first obtained in the free state by Sir Humphry Davy in 1808. Its compounds are exceedingly abundant and are widely distributed. Calcium carbonate, $CaCO_3$, is familiar in the various forms of marble, chalk, limestone, and calcite. The sulphate, $CaSO_4$, is also very common, and is perhaps best known in the form of gypsum, which contains two molecules of water, and therefore has the formula, $CaSO_4 + 2H_2O$. Calcium phosphate also occurs in nature in considerable quantities, both in the form of fossilized bones and as apatite (q.v.), and its various modifications.

Metallic calcium may be obtained by the electrolysis of the fused chloride (which melts at a red heat), or by decomposing the iodide with metallic sodium. It has a light yellow color, has a hardness about equal to that of gold, and (according to most authorities) is very malleable and ductile. Its chemical symbol is Ca, its specific gravity is about 1.58, and its atomic weight is 40.0 if O = 16, or 39.7 if H = 1. Perfectly dry air does not affect it at ordinary temperatures, but in moist air it becomes rapidly coated with the hydrate, $Ca(OH)_2$. When strongly heated in air it burns with a yellow flame, taking up oxygen to form the oxide, CaO. It decomposes in water rapidly, passing into the form of the hydrate, with evolution of hydrogen. It melts at a red heat, has a specific heat of about 0.169, and has an electrical resistance only about one-twelfth of that of mercury.

In its chemical relations calcium is a dyad. It combines with almost every known acid, and yields a vast number of compounds, many of which are of great industrial value. Of these the best known are the carbonate, oxide, hydrate, chloride, sulphate, fluoride, carbide, and bisulphide, and the indefinite mixture of the chloride and hypochlorite known as bleaching-powder. For the more important compounds, see BLEACHING POWDER; GYPSUM; LIME.

CALCIVOROUS, a. *kăl-sĭv'ŏ-rŭs* [L. *calcem*, lime; *vōro*, I devour]: eroding or eating into limestone rock.

CALCOGRAPHY, n. *kăl-kŏg'ră-fĭ* [L. *calcem*, lime or chalk; Gr. *grapho*, I write]: the art of engraving in the style of a chalk-drawing.

CALCOTT, Sir AUGUSTUS WALL: also CALCOTT,

JOHN WALL (common but erroneous form): see CALLCOTT.

CALC-SINTER, n. *kălk'sĭn'tėr* [L. *calcem*, lime; Ger. *sinter*, sinter; *sintern*, to drop]: a stalagmitic or stalactitic deposit from calcareous waters. CALC-SPAR, or CALCAREOUS-SPAR, crystallized carbonate of lime or calcite. CALC-TUFF, *-tŭf*, or CALCAREOUS-TUFA, *-tu'fă:* see under CALCAR 2.

CALC-SINTER, *kălk'sĭn-tėr:* a mineral, chemically identical with the purest marble and calcareous spar, but peculiarly characterized by its fibrous structure. It is formed from water holding carbonate of lime in solution, and occurs generally incrusting the roofs, walls, and floors of caves, particularly those in limestone rocks; often assuming curious and even fantastic forms. Macalister's Cave, in the Isle of Skye, and the limestone caves of Derbyshire, are the most celebrated British localities. But the stalactitic cave of Antiparos, in the Grecian archipelago, is a far more famous locality for this mineral, which is often called *Calcareous Alabaster*, and used for the same purposes with the true alabaster (q.v.), to which it is in some respects preferable, particularly as not being liable to injury from exposure to the air. Volterra, in Tuscany, is another famous locality for Calc-sinter.

CALCULATE, v. *kăl'kū-lāt* [L. *calcŭlātus*, calculated—from *calcŭlus*, a pebble: F. *calculer*, to calculate]: to perform any operation in arithmetic or mathematics in order to find a result; to compute; to estimate anything; to estimate; in *OE.*, to predict. CAL'CULATING, imp.: ADJ. having skill in calculations, or in the habit of making them; far-seeing. CAL'CULATED, pp. CAL'CULATOR, n. one who. CAL'CULABLE, a. *-lă-bl*, that may be calculated. CAL'CULA'TION, n. *-lā'shŭn*, computation; the result of an operation in arithmetic; an estimate arrived at in the mind by comparing various facts. CAL'CULA'TIVE, a. *-tĭv*, tending to calculate. CALCULE, v. *kăl'kūl*, in *OE.*, to calculate.—SYN. of 'calculate': to reckon; compute; count; estimate; enumerate; rate.

CAL'CULATING MACHI'NE: a remarkable application of machinery to the work of manipulating figures. Various machines have been constructed for this purpose, differing in range of function, and in principle. By the *Arithmometer*, invented by M. Thomas, of Colmar, France, all ordinary arithmetical operations are executed; and by a machine contrived by by M. M. Schentz, which rests on the principle of *Differences* (q.v.), by the turning of a wheel, the successive terms of any series whose law may be confided to it, are produced—the machine at the same time *printing* a large proportion of its results, and thus providing for the accuracy of its tables. An Englishman, Charles Babbage (q.v.), made the greatest advance in this ap-

plication of machinery. Among his inventions was a *Difference Engine*, of very comprehensive powers, capable of managing series so complex that the differences of its terms do not reach zero until the seventh order is reached. An immense range of nautical and astronomical tables lie within these limits; and the machine further tabulates approximately any series whatever that can be treated by the *Method of Differences*. While engaged in constructing the *Difference Machine* Mr. Babbage, probably through his increased experience of the capabilities of machinery, was led to form a new conception—that, namely, of the *Analytical Machine*. He actually succeeded so far as to devise the means of making his machine perform all the elementary operations of addition, subtraction, multiplication, and division; and it is clear that all changes that can be produced on quantity are merely combinations of these. If, then, he could but have made his machine perform these operations at command, and according to any special order, it could have clearly developed any function whatever whose law is ascertained and fixed. A solution of this difficulty was suggested by the Jacquard Loom (q.v.), in which the *cards* oblige a machine capable of working *any* pattern to work out one particular pattern; and Mr. Babbage having succeeded so far as to form a machine capable of executing any development, expected, by means of *cards of operations*, to compel his Calculating Machine to work according to one fixed law, and no other. Government, however, did not see its way to make the further grants required for this machine, and at Mr. Babbage's death, in 1871, nothing further had been done toward its completion. The *Difference Machine* is now lying, an unfinished curiosity, in the Museum of King's College, London. Both machines are described in the third vol. of Taylor's *Scientific Memoirs*. The *Difference Engine*, constructed by Grant for the Univ. of Pennsylvania, is said to be less expensive than Babbage's and less complicated than Scheutz's, though provided like it with an apparatus for printing the results.

CALCULOUS, a. *kăl'kūlŭs* [Med.]: like a bone—gritty.

CALCULUS, n. *kăl'kū-lŭs* [L. a pebble]: in *surg.*, a stone in the bladder; a branch of mathematics. CAL'CULAR'Y, a *-lēr'ĭ*, relating to the disease of the stone; N. the mass of little stony knots in some fruits. CAL'CULOUS, a. *-lŭs*, stony; gritty; also CAL'CULOSE, a. *-lōz*.

CAL'CULUS, or STONE, in Medicine; hard concretion formed within the animal body, in consequence of the deposition in the solid form of matters which usually remain in solution: see CONCRETION. The concretions most commonly termed calculi are those formed in the kidneys or bladder (*Urinary Calculus*); and those

formed in the gall-bladder or biliary ducts (*Biliary Calculus*). Both give rise to very painful symptoms, and may even threaten life.

Biliary Calculus, or *Gall-stone*, may generally be presumed to exist when excessively severe pain suddenly arises in the right side beneath the border of the ribs, and when in a few hours jaundice comes on, showing that some obstruction has existed to the outward flow of the bile. But the absolute proof that these symptoms depend on Calculus is often wanting. The pain is fortunately transitory, but is more severe while it lasts than almost any other known form of suffering, unless it be that of a Calculus in the kidney and ureter. It may be relieved by large doses of opium, but the remedy requires to be cautiously given, as even in medical hands fatal accidents have occurred in its use. Gall-stones, when impacted in the ducts, sometimes have proved fatal; but much more frequently they find their way, sooner or later, into the intestines. They are almost invariably composed of cholesterine (q.v.), with coloring matter and mucus, arranged in layers in a semi-crystalline disposition.

Urinary Calculus is a disease of all ages, but most common in advanced life and in the male sex. It is also most frequent in gouty persons, or among those who pursue sedentary occupations, and live freely. It is rare among those who live much in the open air, or who take much violent exercise, and use little animal food and wine. Among sailors, it is peculiarly rare. In certain regions the disease is said to be frequent. In India, where some of the predisposing circumstances mentioned above do not prevail, stone is by no means uncommon. It would appear, therefore, that the predisposing causes of Calculus are still imperfectly understood. In its early stages, the disease usually presents itself in the form of *Gravel*, shown by the passage of numerous very small portions of gritty concretions, which may be observed in the urine as a deposit like sand, or like small grains of Cayenne pepper. When such deposits occur frequently, especially if they are present at the time of passing the urine, and not merely after it has cooled, there is reason to apprehend the formation of calculus. If, in these circumstances, there are pains of a dull character in the loins, with occasional twinges of sharper suffering, no time should be lost in seeking medical advice. If a fit of very severe pain should occur in a person for some time affected with gravel, if the urine be bloody, if agonizing twinges, commencing in the loins, sting downward into the thigh or the groin, it is probable that a stone has already formed in the kidney, and is being displaced toward the bladder. Calculus in the bladder is at first attended with little suffering, as compared with that caused by the stone in its passage downward from the kidney; but unless removed or evacuated, the Calculus

is sure to enlarge, and it then becomes the cause of one of the most painful diseases that afflict humanity. The existence of a stone in the bladder, however, should never be taken for granted without a surgical examination, as all the symptoms are deceptive in certain cases. The most striking and perhaps the most trustworthy evidence of stone in the bladder, apart from the use of the sound (see LITHOTOMY), is smarting and burning pains experienced after the bladder has been emptied, together with occasional temporary stoppage in the flow of urine. The correct appreciation of all the symptoms, however, demands considerable familiarity with such cases.

The discovery of the tendency to urinary Calculus at an early period of its growth, has been greatly aided by the use of the microscope and of chemical tests. Generally speaking, it may be said that whenever the urine, after standing for a few hours, can be observed to contain more sediment than a very slight cloudiness toward the bottom of the vessel, there is room for careful inquiry into the existence of some derangement of the health. But all sediments are not equally apt to determine Calculus, nor is the treatment of the different kinds of sediment at all similar; care should therefore be taken to determine, from time to time, whether the character of the sediment may have undergone a change, so that the treatment may be adapted accordingly. The cut section usually shows a laminated structure and a nucleus or starting point, which may be a blood clot. a shred of tissue, a bit of mucus, a small renal calculus, a mass of urates or a foreign body. Any conditions encouraging excessive deposition of the urinary constituents predispose to urinary calculi. Among such causes are lack of exercise, digestive disorders, defect oxidation, excesses in eating or drinking, catarrhal conditions of the urinary tract, etc. The tendency to stone formation is particularly pronounced in those having what is called the gouty or lithemic diathesis. The diagnosis of renal calculi is facilitated by the use of the *x*-ray, while for the detection of bladder stones a special form of steel sound termed a 'stone searcher' is introduced into the bladder. The cystoscope is also of great service in this field. Individuals predisposed to stone should keep the urine abundant by the free use of water—preferably distilled—and milk, should take much open air exercise, and avoid the consumption of large amounts of meat, fats, sugar, or alcohol. Green vegetables, salads, bread, poultry, fish, eggs, and fruit should form the main articles of diet.

The chief varieties of urinary Calculus are—1. Uric acid (red sand); 2. Urates of ammonia, soda, lime, etc.; 3. Phosphates of ammonia and magnesia, lime, etc.;

etc.; 4. Oxalate of lime; 5. Carbonate of lime (chiefly in domestic animals); 6. Cystine; 7. Xanthic oxide (a very rare form, discovered by Dr. Marcet). Calculi are frequently found to be composed of numerous successive layers, having a perfectly distinct chemical composition. Urates and phosphates in particular frequently succeed each other, and form what is called an alternating calculus.

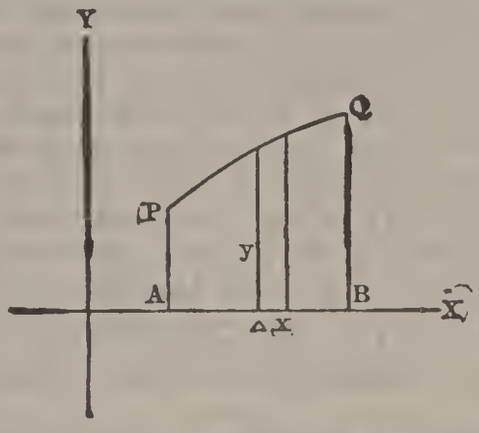
When C. has once fairly formed in the urinary passages, it seems probable that no absolute cure exists except the removal of it, if possible, from the body (see LITHOTOMY and LITHOTRITY): but in the stage of gravel, and still more in the earlier stage detected by careful examination of the urine, much may be done to check the tendency to this distressing and dangerous malady. The chief remedies consist in careful regulation of the diet and mode of living together with the use of solvents adapted to the particular form of deposit. See URINE.

CALCULUS, THE DIFFERENTIAL AND INTEGRAL, also called the Infinitesimal Calculus; a branch of mathematics which deals with continuous numbers or quantities. Nature itself presents an endless variety of continuous objects and processes. Space, time, material bodies, all possess continuity, each part being joined to the next without break or interval. All motions, of a planet, an engine wheel, the flow of a river or an electric current, the rise and fall of temperature, the expansions and contractions which they produce in a material body are continuous. The C. is therefore eminently a practical science; and, on the other hand, from its wide application, it possesses great possibilities of theoretic development as a branch of pure mathematics. This theoretic development was indeed indispensable, as in the case of all sciences, in order that the mass of complicated phenomena might be sifted and expressed in simple general laws. But before this could take place, it was necessary to have some means of fixing, by measurement and in terms of numbers, the position of each point or moving particle, or other element considered. This was accomplished by Descartes' invention of coordinate geometry (1637). From that time on, every point or element of mass could be represented by its coordinates, every curve or surface defined by an equation, and every problem of geometry or physics expressed in analytic form in terms of numbers x, y, etc.

One of the first problems the study of which led to the invention of the C. was that of finding the area enclosed by a curve. A simple form of the problem is illustrated by the figure, where it is required to find the area A P Q B bounded by the curve P Q, the ordinates A P, B Q and the axis of X. This area may be approximately determined by drawing a number of vertical lines across it, thus dividing it into strips. The area of each strip is approximately $y\Delta x$, and the entire area is approximately the sum of the quantities $y\Delta x$, indicated by $\Sigma y\Delta x$. The approximation is the closer, the narrower the strips, and consequently the greater their number. Each $y\Delta x$

approaches 0 as the width Δx diminishes, but their number increases indefinitely; and under these two opposite influences their sum tends toward a definite limit, the exact area required. This area, then, is the *limit* of $\Sigma\, y\Delta x$; this limit is denoted by $\int ydx$, and called the *integral* of ydx. (The symbol $\int$ is merely a modified S.) For completeness the values of x at A and B are attached to the integral sign, thus: $\int_a^b ydx$, read 'integral from a to b of ydx.' The equation of the curve P Q permits the expression of y in terms of x; the integral involves then only x and dx. The problem is now analytically formulated; the determination of the actual value of the integral by analytic processes is the province of the Integral C.

Another problem contributing to the discovery of the C. was that of finding the tangent at a given point of a curve. If the coordinates of the point are x, y, those of a second point of the curve, near the first, may be written $x+\Delta x$, $y+\Delta y$, Δx and Δy being the increments of x and y in passing from the first point to the second. If the secant joining the two points makes the angle φ with the



axis of X, we have $\Delta y/\Delta x = \tan\varphi$. If the second point is made to approach the first along the curve, Δx and Δy both tend toward 0, but their ratio remains constantly equal to the tangent of the variable angle φ. Now this angle approaches the angle θ which the tangent at the first point makes with the axis of X. Hence the ratio $\Delta y/\Delta x$ approaches $\tan\theta$, or $\lim \Delta y/\Delta x = \tan\theta$. A second problem of the (differential) C. is therefore the determination of this limiting value $\lim \Delta y/\Delta x$. It is denoted by dy/dx, thus $dy/dx = \lim \Delta y/\Delta x$. Any two numbers dy, dx whose ratio is the same as this limiting value are called *differentials* of y and x; the ratio itself is called the *derivative* of y with respect to x. The process of obtaining the derivative is called differentiation. As a simple example suppose that $y=x^2$; then $y+\Delta y=(x+\Delta x)^2=x^2+2x\Delta x+\Delta x^2$, $\therefore$ $\Delta y=2x\Delta x+\Delta x^2$, $\Delta y/\Delta x=2x+\Delta x$. As Δx approaches 0, $\lim \Delta y/\Delta x=2x=dy/dx=\tan\theta$.

The two problems above, integration and differentiation, seem at first sight to be entirely unconnected with each other. But in reality, as a matter of analysis, they stand in very close relation. Suppose that in the first

problem the area has been determined from $x=a$ up to any x, and let it be denoted by u. If x is then increased by Δx, u is increased by $\Delta u = y\Delta x$, where y is the mean altitude of the annexed strip. Then $\Delta u/\Delta x = y$, and $\lim \Delta u/\Delta x = du/dx = y$, the ordinate at x. To find u, then, we have simply to seek an expression in x *whose derivative is* y. Thus for the curve $y=x^2$, we have $du/dx=x^2$, whence it is easily found that $u=\frac{1}{3}x^3+C$, C being a constant quantity depending on the $x=a$ from which u is measured. Thus if $a=0$, $C=0$, and the area from $x=0$ to $x=2$ is $\frac{1}{3}\,2^3=8/3$.

These examples represent the two fundamental problems of the C., viz., the differentiation and the integration of all expressions containing a variable x. Such expressions are called *functions* of x, they are often indicated briefly by symbols $f(x)$, $F(x)$, $\varphi(x)$ . . . Thus if the expression $x^3-3x\cos x+\tan x$ is to be used repeatedly, it may be denoted once for all by $f(x)$, and cited simply as $f(x)$. The derivative $df(x)/dx$ of $f(x)$ is denoted by $f'(x)$; its derivative again is written $d^2f(x)/dx^2$ or $f''(x)$, and so on. Of the rules for differentiation only a few can be here mentioned; for the others the reader must consult the text-books and treatises. For a sum of two functions $u+v$, we have $d(u+v)/dx=du/dx+dv/dx$; for a product $d(uv)/dx=vdu/dx+udv/dx$; for a power $d(u^n)/dx=nu^{n-1}du/dx$ $\therefore$ $d(x^n)/dx=nx^{n-1}$; also $d\sin x/dx=\cos x$, $d\cos x/dx=-\sin x$, $de^x/dx=e^x$. Reversing the last formulæ, we find $\int x^n dx = x^{n+1}/(n+1)$. $\int \cos x\,dx=\sin x$, etc. Thus, recalling the definition of an integral as a sum, we have for example line $\Sigma \cos x\,\Delta x$, taken through the quadrant from $x=0$ to $x=\frac{1}{2}\pi$, $=\int_0^{\frac{1}{2}\pi}\cos x\,dx=\sin x\big]_0^{\frac{1}{2}\pi}=\sin\frac{1}{2}\pi-\sin 0=1$, which is the area of the curve $y=\cos x$ from $x=0$ to $x=\frac{1}{2}\pi$.

These, and similar problems occupied the attention of mathematicians through the 17th and 18th centuries. The list of those engaged in this study includes some of the greatest names in mathematical history: Descartes, Fermat, Cavalieri, Leibniz, Newton, Maclaurin, Euler, Lagrange, and others. For the C. has almost unlimited possibilities of application to geometry, physics, mechanics, astronomy and other sciences, in fact some of these owe their greatest advances to the aid which they have received from the C.

After a long controversy between their respective adherents, Newton (1642-1727) and Leibniz (1646-1716) are now both credited with the independent invention of the C. Leibniz's point of view was mainly analytical; his system is based on infinitesimals, i. e., quantities which approach 0, like Δx and Δy above. Newton's range of vision was wider and his ideas more definite, for his standpoint was that of physics and mechanics. He conceived of the variables $x, y, z, \cdots$ as changing with the time, as 'fluents,' having *velocities* $\dot{x}, \dot{y}, \dot{z}, \cdots$ These velocities, which in our modern notation are dx/dt, dy/dt, dz/dt, $\cdots$, he called 'fluxions.' His work *Methodus*

Fluxionum was completed in 1671, but was not published until 1736, after his death. It is to Newton that we owe the accurate formulation of the theory of limits (q. v.). The symbols and notation of the C. are largely due to Leibniz, who introduced in particular the symbols $\int$ and dx and stated the rules for operating with them. Derivatives were first systematically employed by Lagrange (1736-1813); the germ of the idea was contained in Newton's fluxions. Leibniz began to publish his invention in 1686; his analytic treatment was superior to that of Newton, and his methods and notations were immediately adopted by the European mathematicians, except in England where the Newtonian system prevailed into the middle of the 19th century.

Among the simpler applications of the C. is that to the theory of Maxima and Minima. Given a function of x, $y=f(x)$, if x is allowed to increase continuously, y will also vary continuously but may either increase or decrease. It may increase for a time and then decrease, or vice versa. When y increases with x Δy and Δx are both positive, and therefore dy/dx=line $\Delta y/\Delta x$ is positive; but if y decreases as x increases, dy/dx is negative. At the 'turning point,' where y ceases to increase and begins to decrease, or vice versa, dy/dx will be 0. These turning points are called maxima and minima of the function $y=f(x)$. They are found by putting $dy/dx=0$. For example, let it be required to divide a number a into two parts x and $a-x$ such that their product $x(a-x)$ shall be a maximum. Here $y=x(a-x)=ax-x^2$, $dy/dx=a-2x$. Hence, for a maximum $a-2x=0$ or $x=\frac{1}{2}a$. The number a must be divided into equal parts. To state the result in geometric form, a rectangle of given perimeter $2a$ has its maximum area when it is a square.

Again: A square piece of pasteboard whose side is a has a small square whose side is x cut out of each corner; find the side x of this square that the remainder may form a box of maximum contents. The contents of the box are $y=x(a-2x)^2=a^2x-4ax^2+4x^3$. Here $dy/dx=a^2-8ax+12x^2$. Putting this equal to 0, we find $x=\frac{1}{6}a$ or $\frac{1}{2}a$, of which only the former solution is here available.

Among the other results of the Differential C. are Taylor's Theorem for the expansion of a function in infinite series:

$$f(x+h)=f(x)+hf'(x)+\frac{h^2}{2}f''(x)+\frac{h^3}{3!}f'''(x)+\cdots$$

which is of constant use in approximations (h being a small number and therefore the later terms of the series being negligible in comparison with the earlier ones), in determining the limiting value of the forms $0/0$, 0, ∞, 0^0, etc., and in analytic geometry. Related to Taylor's Theorem is the Mean Value Theorem, one of whose forms is

$$f(x+h)=f(x)+hf'(x+\theta h),$$

where θ is a number less than 1. Of the numerous applications of the C. to Geometry only brief mention can

be made here of tangents, normals, curvature, evolutes, envelopes, multiple points, etc.

In mechanics, if a point moves along any path through a varying distance s, its velocity is ds/dt, or if the velocity v is given we have $s=\int v dt$. The velocity resolves into two components dx/dt parallel to the X axis and dy/dt parallel to the Y axis. The derivatives of these components with respect to t, d^2x/dt^2 and d^2y/dt^2, are called the *accelerations* parallel to the axis. If the latter are given, x and y can be found in terms of t, and by elimination of t an equation between x and y results which is the equation of the path of the moving point.

The formulæ of the Integral C. are generally much more complicated than those of the Differential. In fact the Integral C. presents many new problems which are not solvable with ordinary functions, and therefore offer fresh fields for advanced investigation. Among the simpler applications are the determinations of areas, surfaces, and volumes, of centres of gravity, moments of inertia and other physical and mechanical quantities. These are usually effected by the aid of several integrations taken successively with respect to the three coordinates x, y, z, of space geometry. The theory of celestial mechanics rests mainly on the Integral C. On the purely analytical side the Integral C. has two especially important developments, Differential Equations (see below), and the Theory of Functions (see FUNCTIONS).

DIFFERENTIAL EQUATIONS.—Many of the problems of the Integral C. reduce, when analytically formulated, to the solution of an equation involving derivatives with respect to one or more of the variables, for example:

$$\frac{d^2y}{dx^2}=a; \qquad \frac{d^2y}{dx^2}-x\frac{dy}{dx}=3y; \qquad \frac{dx}{dt}=y, \quad \frac{dy}{dt}=x.$$

Such equations are called differential equations. A simple instance from mechanics is furnished by the motion of a body falling under gravity near the earth's surface, all other influences (as resistance of the atmosphere) being disregarded. The acceleration d^2y/dt^2 is in this case constant being $-g=-32.2$ feet per second per second. The problem reduces to the solution of the differential equation $d^2y/dt^2=-g$; the first integration gives $dy/dt=-gt+c$, and if the initial velocity $v=dy/dt$ is 0, then $c=0$, and $dx/dt=-gt$. A second integration gives $y=-\frac{1}{2}gt^2+c'$, and if the height y of the body is initially y_0, then $c'=y_0$, and we have $y=-\frac{1}{2}gt^2+y_0$ or $y_0-y=\frac{1}{2}gt^2$. Here y_0-y is the distance fallen in the time t.

The theory of Differential Equations has been greatly advanced in recent years. For any adequate idea of its methods reference must be had to the numerous treatises on the subject. An elementary account may be found in the recent books of Murray and Cohen.

CALCULUS OF VARIATIONS.—The object of this C. is to find a function $y=f(x)$ such that the value of the integral, between the limits a and b, $\int_a^b F(x,y,y')dx$ may be a minimum, F being a given function and $y'=dy/dx$.

Such problems occur frequently in mechanics. A celebrated instance is John Bernoulli's problem (1696) of the Brachistochrone, or curve of quickest descent, to which in fact the Calculus of variations owes its origin. Here the time of descent along a curve $y = f(x)$ is found to be $\int_a^b (\sqrt{x'^2 + y'^2}/\sqrt{2gy})\,dx$, and it is required to determine the equation $y = f(x)$ of the curve such that this time shall be a minimum. It turns out that the required curve is a cycloid. A number of similar examples may be found in Todhunter's Integral Calculus. Of recent years the Calculus of variations has been practically reconstructed and organized to a much higher point of development than it had formerly reached. The older treatises are therefore only of historic interest. Among them may be mentioned the works of Jellett and Carll. Much of the recent development is due to Weierstrass. Modern treatises are those of Kneser (1900) in German, and Bolza (1904) in English.

Calculus of Finite Differences.—For a brief notice of this subject, see Difference.

CALCUTTA, *kăl-kŭt'ta* (*Kali Ghatta*, the ghaut or landing-place of the goddess Kali): capital of the province of Bengal, and metropolis of British India; on the left bank of the river Hooghly, an arm of the Ganges, 22° 35′ n. lat., 88° 27′ e. long.; about 100 m. from the sea by the river. Calcutta was founded by Gov. Charnock, 1686, by the removal hither of the factories of the East India Company. In 1700, three villages surrounding the factories, having been conferred upon the company by the emperor of Delhi, they were forthwith fortified, and received the name of Fort William, in honor of the reigning king; but the place was subsequently termed Calcutta, the name of one of the villages. In 1707, Calcutta had acquired some importance as a town, and was made the seat of a presidency. In 1756, it was unexpectedly attacked by Surajah Dowlah, the Nawaub of Bengal, and was compelled to yield after two days' siege. The city remained in the hands of the enemy until eight months afterward, when Clive, in conjunction with Admiral Watson, recaptured the town. In 1852 Calcutta was erected into a municipality.

The city extends about five miles along the river, and is somewhat less than two miles in breadth; area about eight square miles, comprised for the most part between the river and the Circular Road, a spacious roadway which marks the landward boundary of the city proper. Beyond this road lie extensive suburbs. The appearance of the city as it is approached by the river is very striking; on the left are the Botanical Gardens, destroyed by the cyclones of 1867 and 1870, but since replanted, and the Bishop's College, a handsome Gothic edifice, erected by the Soc. for the Propagation of the Gospel in Foreign

Parts; on the right is the suburb of Garden Reach, with its handsome country seats and beautiful gardens; further on are the government dockyards and the arsenal; beyond these is the Maidan Esplanade, which has been termed the Hyde Park of India, being the favorite place of resort of the *élite* of C. for their evening drive. Here, near the river, lies Fort William, the largest fortress in India, constructed at a cost of £2,000,000, and occupying, with the outworks, an area of about half a mile in diameter. It is garrisoned by European and native soldiers, mounts 619 guns, and its armory contains 80,000 stands of small-arms. Facing the Esplanade, among other fine buildings, is the Government House, a magnificent palace erected by the Marquis of Wellesley. Beyond this, extending n. along the river bank, is the Strand, two m. in length, and 40 ft. above low water, with various ghauts or landing-places. It is adorned by many fine buildings, including the Custom-house, the new Mint, and other government offices, and the appearance of these and other edifices has gained for C. the appellation of 'City of Palaces.' Among other places of interest are the Sudder Dewanee Adawlut, the principal court of justice; the town-hall, a fine building; the Bengal Club, Writers' Buildings, Bank of Bengal, Jesuits' College, Medical College, university, theatre, besides various churches, mosques, Hindu temples, and pagodas and numerous bazaars. There are a number of monuments, throughout the city, the most noticeable being those erected to the Marquis of Wellesley and Sir David Ochterlony. While the European quarter is distinguished for its fine public buildings and commodious dwelling-houses, the quarters occupied by the natives contain houses in most instances built of mud or bamboo and mats, and the streets are narrow and unpaved. Considerable improvements have, however, been effected of late; new and wider streets have been opened through crowded quarters; brick houses are fast replacing the huts, and an extensive system of drainage has been carried out, to the no small advantage of the inhabitants. The cyclone of 1867, Nov., destroyed 30,000 native houses, and that of 1870, June, likewise was very destructive.

The water supply of C. has recently been much improved. Formerly, the water was kept in large tanks, interspersed through the city, whence it was borne by water-carriers or *bahisties* in large leather bags. But within quite recent years, a supply of excellent water has been obtained from the Hooghly, about 15 m. above C., where it is filtered and sent down by pipes in the usual way. The result of this has been marked improvement in the health of the city. Gas has now taken the place of the oil-lamps formerly in general use for lighting the streets. Street railways have been recently tried in some of the principal streets, but as yet with little success. A canal girds a part of the city beyond the Circular Road.

The communications of C. afford great facilities for its extensive commerce. There are several lines of railway to various parts of India; the East Indian to Benares,

Delhi, and Multan, its present terminus, whence it is to be continued to Kurachee; the Eastern Bengal, the extension of which to Gulundu was opened 1871; and the Calcutta and Southeastern to the mouth of the Ganges. The great Indian Peninsula railway branches off from the East Indian and connects Calcutta with Bombay and Madras. Calcutta is also connected by electric telegraph with the principal towns of India, and can communicate with England by three different lines. Uninterrupted communication is kept up with Great Britain by numerous and well-appointed steamers and sailing vessels. This intercourse has been greatly facilitated by the opening of the Suez canal. Navigation on the Hooghly is dangerous, owing to the shifting sands; and though much has been attempted, little has been effected in the way of remedying the evil. The river, adjacent to the city, varies in breadth from a quarter of a mile to nearly a mile. Ships of 2,000 tons can ascend to Calcutta.

The growth of scientific and literary societies, here and elsewhere in India among the native communities, indicates hopeful progress and intellectual activity. The principal of these in Calcutta are the Bengal Asiatic Soc. founded 1784 by Sir W. Jones, possessing a fine library, and a valuable and extensive museum; the Bethune Soc. for the promotion of intercourse between European and native gentlemen; the Dalhousie Institute, for the literary and social improvement of all classes of the community; the Bengal Social Science Assoc. and others. The university of Calcutta was founded 1857, on the same basis as the London Univ. and exercises its functions over Bengal, the N. W. Provinces, Oudh, and the Central Provinces. Colleges have been instituted to prepare intending students. Other educational institutions are numerous in Calcutta. The principal places for religious instruction are Bishop's College, intended chiefly for the education of missionaries and teachers, and the institutions of the Established and Free Churches of Scotland.

Calcutta may be regarded as the great commercial centre of Asia. One-third of the whole trade of India is done here. The chief exports are cotton, silk, jute (raw and manufactured), rice, wheat, indigo, tea, sugar, shellac, opium, saltpetre, oil seeds, hides, and horns; while the more important imports are wearing apparel, machinery, iron goods, cotton and woolen goods, beer, wine, spirits, and coal. The manufactures of Calcutta have of late much increased; the annual imports by rail, steamer and country boat amounting to more than $300,000,000, and the exports to about $125,900,000. The principal industries are sugar refining, cotton manufacturing, flour, saw and oil mills, and ship-building docks. Several newspapers are published. There are a few banks and numerous insurance and other companies, with a chamber of commerce. Living is comparatively cheap,

and most of the luxuries of life, as well as its necessaries, are to be had in the unpretentious shops of Calcutta as readily as in most European towns. The annual fall of rain averages 64 inches; the temperature in the shade ranges in July from 78° to 87°, and in December from 60° to 79°.

Calcutta is the headquarters of the gov.gen. of India, and the seat of the government, the supreme courts of justice, and of the court of appeal for the province of Bengal.

The inhabitants of Calcutta are mostly Hindus; but there is also a proportion of Mohammedans. About 20,000 are Europeans; 20,000 Eurasians, or the progeny of white fathers with native mothers, and there is a considerable number of Armenians, Greeks, Jews, Parsees, and negroes. Besides these residents thousands of the three and a half millions who sleep at night in the surrounding districts of Hooghly and the 24 Pergunnahs, flock during the day to Calcutta on foot, by boat, or by railway, to their daily toil. Pop. of town proper (1837) 229,700; (1872) 447,601, or with Howrah and suburbs 892,429; (1881) without Howrah, 683,458; (1901) with suburbs, 1,125,400.

CALDAS, *kâl'dâs*, or CALDETAS, *kâl-dā'tas* [Lat. *callidus*, hot]: Spanish term for warm. springs (*aquas*, waters, being understood); these are very abundant in the Peninsula, where a great number of places have received their names from the presence of these mineral waters.

CALDECOTT, Randolph: Eng. art.; 1846, Mar. 22—1886, Feb. 12; b. in Chester; bank clerk 1861-72. In 1872 settled in London and gave his atten. to art, for which he developed a fine taste. Chiefly remembered by the admirable *Caldecott's Picture-books*, which began in 1878 with *John Gilpin* and *The House that Jack Built*.

CALDER, *kawl'dėr:* river in the West Riding of Yorkshire, England. It rises in a marsh on the borders of Lancashire, near Burnley, runs tortuously e. in the deep valley of Todmorden, past Halifax, Dewsbury, and Wakefield. It then runs n.e., and after a total course of 40 m., it joins the Aire near Pontefract, that river falling into the Ouse.

CALDERON, *kâl-dā-rōn'*, Don Serafin Estebanez: Spanish poet: b. Malaga about the beginning of the 19th century; d. 1867, Feb. He studied law at the University of Granada, and in 1822 became professor of peotry and rhetoric there. A volume of poems which he published shortly afterward won some distinction. Subsequently, he became an advocate in his native city, but continued faithful to the muses. In 1830, he went to Madrid, where he published anonymously his *Poesias del Solitario* (1833). He also wrote several articles on Andalusian manners for the *Cartas Españolas*, the only literary journal at that period in Spain. In 1836 he was appointed civil gov. of Logroño, but an accident compelled his return to Madrid, where he applied himself to collecting MSS. of the old national literature, to be the basis

of a great critical edition of the *Cancioneros* and *Romanceros*. C. wrote likewise a fine novel, *Cristianos y Moriscos*. To the literature of the Spanish Moors he paid great attention. His *Escenas Andaluces* (1847) are a series of lively sketches of Andalusian life. At his death he left a work on the *Expediciones y Aventuras de los Españoles en Africa*. The Spanish government purchased his valuable library.

CALDERON (Don Pedro) DE LA BARCA HENAO Y RIANO, *kăl'der-on*, Sp. *kâl·dā-rōn' dā lâ bar'kâ ā-nâ'o ē rē-â'no:* Spanish poet: 1601–1681, May 25; b. Madrid: received his early education in the Jesuits' College at Madrid. Afterward, at Salamanca, he studied chiefly history, philosophy, and law. His poetical genius was precocious. Before he was 14 years old he had written a drama, *El Carro del Cielo* (The Celestial Chariot). In early life he gained, by his poetry, and by his fertile invention of decorations, etc., for festive occasions, the patronage of several distinguished persons, and, on leaving Salamanca, 1619, was well received by the courtiers at Madrid. Love of military adventure induced him to enter the army, 1625; and, after serving with distinction in Milan and the Netherlands, he was recalled to the court of Philip IV., a prince fond of theatrical amusements, by whom he was employed to superintend various court-amusements, and especially to invent dramas for the Royal Theatre. In the following year C. was made knight of the order of San Jago, and took part in the campaign in Catalonia. Peace brought him back to poetry. The king gave him a pension, contrived to let him cultivate uninterruptedly his fertile dramatic genius, and spared no cost in securing for his plays a splendid initiation on the stage. In 1651, C. received from the head of the order of San Jago permission to enter the priesthood, and, in 1653, was appointed to the chaplaincy of the arch-episcopal church of Toledo; but as this post removed him too far from the court, he was appointed chaplain in the Royal Chapel at Madrid, 1663, and received, with other favors, a pension charged on the revenue of Sicily. In the same year he was appointed a priest in the brotherhood of San Pedro, and, shortly before his death, was elected by his brethren as their *caplan mayor*. At his death he left his considerable property to the fraternity of San Pedro, by whom a splendid monument to this memory was raised in the church of San Salvador at Madrid. Fame and pecuniary prosperity had accompanied his career. The chief cities of Spain—such as Toledo, Seville, and Granada—had paid him, from time to time, large sums of money for writing their *Autos Sacramentales*, or *Corpus Christi* pieces. These compositions in which C. excelled all his predecessors, he esteemed more highly than all his other works, though in many respects the latter show the author's genius quite as remarkably.

Spain numbers C. among its greatest poets, and criticism must allow that many of the defects in his works are to be ascribed to circumstances, and the times in which he lived, rather than to the native tendencies of his genius. He is characterized by brilliancy of fancy, elegance of versifica-

tion, and a richness of detail, which from its very abundance often becomes tedious. His collected dramatic works —including many pieces of intrigue, heroic comedies, and historical plays, of which some deserve the title of tragedy —amount to 128. Among his romantic tragedies, the *Constant Prince* (*El Principe Constante*) holds the first rank. Besides these, he wrote 95 *Autos Sacramentales;* 200 *Loas* (preludes); and 100 *Saynetes* (divertissements). His last play, *Hado y Divisa,* was written in his 80th year. His shorter poems have perished; but his dramas have held their place on the stage better than those of Lope de Vega himself. The most complete edition of his dramas appeared at Madrid (9 vols., 1683–89); another was published by Apuntes (10 vols., Madrid, 1760–63). Goethe and Schlegel have made him popular in Germany, but in Britain he is not well known, and in France not cared for.

CALDERWOOD, *kawl'dĕr-wŏd,* DAVID: 1575–1651; descended of a good family: Scottish divine and ecclesiastical historian. About 1604 he was settled as Presb. minister of Crailing, Roxburghshire. Opposed to the designs of James VI. for the establishment of Episcopacy in Scotland, on that monarch's visit to his native country 1617, he and other ministers signed a protest against a bill, then before the Scots parliament, for granting the power of framing new laws for the church to an ecclesiastical council appointed by the king, and in consequence he was summoned before the High Commission of St. Andrews. Refusing to submit, he was committed to prison for contumacy, and then banished from the kingdom. He retired to Holland, and in 1623 published there his celebrated controversial work, entitled *Altare Damascenum*, etc., in which he rigorously examined the origin and authority of Episcopacy. In 1622, a pretended recantation of his protest was published at London by a venal writer, Patrick Scott. While on the continent, C. was known by the quaint appellation of Edwardus Didoclavius, being an anagram on his name Latinized. After King James's death 1625, he returned to Scotland, and for some years was engaged collecting all the memorials relating to the ecclesiastical affairs of Scotland, from the beginning of the Reformation there to the death of James VI. In 1638, he became minister of Pencaitland, near Edinburgh; and in 1643 was appointed one of the committee for drawing up the *Directory for Public Worship in Scotland.* He died at Jedburgh. From the original MS. of his *History of the Kirk of Scotland,* preserved in the British Museum, an edition was printed for the Wodrow Society, 8 vols., 8vo. (Edin. 1842–45), edited by the Rev Thomas Thomson.

CALDIERO, *kâl-de-ā'ro* (ancient *Caldarium*): decayed town of n. Italy, about nine m. e. of Verona. Its thermal springs were in repute as early as the 1st c. of the Christian era, and continued popular until the commencement of the 16th c., after which they gradually became neglected and are now little visited. The Austrians repulsed the French here 1796.

CALDRON, n. *kawl'drŏn* [L. *caldārĭŭm*, a vessel for supplying hot water to a bath—from *caldus* for *calĭdus*, hot: F. *chaudron:* OF. *chaldron:* Sp. *Calderon*]: a large kettle or boiler. CALDERA, n. *kăl-dē'rā*, a Spanish term for one of the deep caldron-like cavities which occur on the summits of extinct volcanoes.

CALDWELL, *kawld'wel*, CHARLES H. B., U. S. N.: 1828, June 11—1877, Nov. 30; b. in Hingham, Mass. He entered the navy 1838, became lieut. 1852, commander 1862, and cap. 1867. In 1858 he defeated a cannibal tribe at Wega, one of the Fejee Islands, and burned their town. 1862, Apr. 24, he took part in bombarding Forts Jackson and St. Philip, but his vessel, the *Itasca*, was disabled by a shot entering the boiler. Caldwell also had a share in the actions with the Grand Gulf batteries on the Mississippi, 1862, and in the operations at Port Hudson, 1863.

CALDWELL, HOWARD WALTER: American historian; b. Bryan, Ohio, 1858, Aug. 26. He was graduated from the University of Nebraska in 1880 and is professor of American history and jurisprudence there. He has written *History of the United States*, 1815–1861 (1896); *Studies in History* (1897); *A Survey of American History* (1898); *Some Great American Legislators* (1899); *Life of Henry Clay* (1899); *Expansion of the United States* (1900); etc.

CALDWELL, *kawld'wel*, JAMES: 1734, Apr.—1781, Nov. 24; b. Charlotte co., Va., of Scotch-Irish parentage: patriot. He graduated at the College of N. J., 1759, and was ordained Presby. pastor at Elizabethtown, N. J., 1762. He ardently espoused the revolutionary cause, did much to rouse the people, served as chaplain and afterward as commissary of N. J. troops, and became noted as the 'soldier parson.' The bell of his church always gave warning of incursions of the enemy. At Springfield he is said to have brought an armful of hymn-books from the pews and distributed them to the soldiers with the words, 'Give 'em Watts, boys.' His zeal provoked the special hatred of the tories; in 1780 his church and house were burned, and his wife, who had been sent for safety to Connecticut Farms, shot from without while at prayer with her children. Caldwell was killed at Elizabethtown Point by James Morgan, a sentinel, who was said to have been bribed to do the deed. The murderer was convicted, and hanged 1782, Jan. 29. A marble monument in commemoration of Caldwell and his wife was dedicated at Elizabethtown on the 64th anniversary of his death.

CALD'WELL, JOSEPH, D.D.: 1773, Apr. 21—1835, Jan. 24; b. Leamington, N. J. He graduated at the College of N. J. 1791, was called 1796 to the Univ. of N. C., then in its infancy, as presiding prof., with charge of mathematics; and became its pres. 1804, taking the chair of moral philosophy. He went to Europe

1824, to procure books and apparatus. Caldwell published a treatise on geom., 1822, and *Letters of Carlton* 1825. He died at Chapel Hill, North Carolina.

CALEDONIA, *kăl-e-dō′nĭ-a:* poetical name sometimes applied to Scotland; being a resumption of that given by the Romans to the country n. of the Wall of Antoninus, whose course was between the Firths of Forth and Clyde. Among the chief tribes of this region were the Caledonii, whence the whole country has been called Caledonia. Tacitus speaks of the Caledonians as having red hair, large limbs; being naked and barefooted; living in tents without cities; supporting themselves by pasturing cattle, by the chase, and by certain ferries; addicted to predatory warfare; and fighting in chariots with shields, short spears, and daggers. They are supposed to have been of Gaelic or Celtic origin, and to have painted their bodies, whence the name Picti or Picts, by which, according to many writers, they were afterward known. Agricola was the first Roman general to come in contact with the Caledonians. In A.D. 84 he defeated them, now united to repel a common enemy, under their chief Galgacus, at the Mons Grampius (or Graupius), the site of which has not been determined. The Romans overran the n.e. of Scotland as far as the Moray Firth, and formed many encampments (of which remains are still seen), but they never reduced the country to a Roman province. Roman coins and military relics have been found in connection with these camps. The name of Caledonii disappears about the beginning of the 4th c., when the inhabitants of Scotland begin to be spoken of as Scots (q.v.) and Picts (q.v.).

CALEDONIA, NEW: see NEW CALEDONIA.

CALEDONIAN, a. *kăl′ĕ-dō′nĭ-ăn* [*Caledōnĭă*, an ancient name of Scotland] Scotch: N. a Scotchman. CALEDONITE, n. *kă-lĕd′ŏ-nīt*, the cupreous sulphato-carbonate of lead, found at the Leadhills in Scotland.

CALEDONIAN CANAL: chain of natural lakes united by artificial canals, crossing the n. of Scotland in a straight line from n.e. to s.w. from the North Sea to the Atlantic, through Glenmore, or the Great Glen of Albin, in Inverness-shire, and touching Argyleshire at the s. end. The sea and freshwater lochs in this line are Beauly, Ness, Oich, Lochy, Eil, and Linnhe. The canal was formed to avoid the dangerous and tedious navigation of vessels, especially of coasters, round by the Pentland Firth, Cape Wrath, and the Hebrides; the distance between Kinnaird's Head and the Sound of Mull by this route being 500 m., but by the canal only 250, with an average saving of 9½ days for sailing vessels. The Caledonian Canal begins in the Beauly Firth, near Inverness, whence a cut of 7 m. joins Loch Ness, which is 24 m. long, 1¼ m. wide. A cut of 6 m. joins Loch Ness and Loch Oich, which is 3½

m. long, ½m. wide. Another cut of 2 m. joins Loch Oich and Loch Lochy, which is 10 m. long, 1 m. wide; and a fourth cut of 8 m. joins Loch Eil at the village of Corpach, 2 m. n. of Fort William. This ship-communication is 60½ m. long, 37½ m. being through natural lochs or lakes, and 23 m. by artificial cuts. Each cut is 120 ft. broad at surface, and 50 at bottom, and 17 deep. The highest part is Loch Oich, 94 ft. above the sea. There are in all 28 locks, each 170 to 180 ft. long, and 40 wide, with a rise or lift of water of 8 ft. Eight of the locks called Neptune's Staircase, occur in succession near the w. end of the canal. Some large mountain streams between Lochs Eil and Lochy are conducted in huge culverts under the canal; and by a new cut the Lochy water is turned into the Spean. The practicability of this great work was shown first by a survey under government in 1773 by the celebrated James Watt; but it was not till 1803 that it was begun under Mr. Telford. The whole line was opened for ships 1823. After three years of repair, it was re-opened 1847. There is regular steam communication by the canal between Glasgow and Inverness.

CALEF, Robert: American merchant of Boston: b. about 1648; d. Roxbury, Mass., 1719, April 13. His fourth son, also named Robert, died in 1722 or 1723, aged about 41. One or the other of these men was the author of a remarkable book on the witchcraft delusion in New England. The best authorities, notably James Savage and Wm. F. Poole, ascribe it to the younger, who was about 23 when it appeared. The book was entitled *More Wonders of the Invisible World* (Lond. 1700), the title being suggested by Cotton Mather's *Wonders of the Invisible World*. The substance of it had been circulated in manuscript several years previous to its publication and its malicious attacks on Cotton and Increase Mather caused a bitter and life-long quarrel between the former and the author. The book abounds in malicious innuendos, directly charges the Mathers with inciting and being in full sympathy with the Salem tragedies, and accuses the Boston ministers, in their advice of 1692, June 15, of endorsing the Salem methods. The animus of the book has been greatly misunderstood, and the popular idea that Calef was a stalwart agent in putting an end to Salem witchcraft is both a myth and a delusion. His book has now become very rare. It was reprinted at Salem in 1796, 1823, and 1861, and at Boston in 1828 and 1865.

CALEFACIENT, a. *kăl'ī-fā'shĭ-ĕnt* [L. *calĕo*, I am warm; *făcĭō*, I make]: warming, giving heat: N. a substance which excites heat at the part where applied. Cal'efac'tion, n. *făk'shŭn*, the operation of making warm; state of being warm. Cal'efy, v. *-fī*, to become hot; to be heated. Cal'efying, imp. Cal'efied, pp.

CALENDAR, n. *kăl'ĕn-dĕr* [L. *calendārĭŭm*, an account-book; It. *calendario*—from L. *calendæ*, the first day of the Roman month—from *calo*, I proclaim]: an almanac; a register of the days, weeks, months, festivals, holidays, etc., in the year; an orderly arrangement or enumeration, as of state papers; a list of prisoners for trial: V. to register. CAL'ENDARING, imp.: N. the act of arranging old documents and state papers, etc., for easy consultation and comparison. CAL'ENDARED, pp. *-dĕrd*. CALEN'DRICAL, a. *-drĭ kăl*, pertaining to. CALENDAR MONTH, a solar month as it stands in the calendar or almanac. CALENDS, n. plu. *kăl'ĕndz*, first day of each month among the Romans.

CALENDAR [from CALENDS, q.v.]: adjustment of the months and other divisions of the civil year to the natural solar year. The phases or changes of the moon supplied an early, as it was a natural and very obvious, mode of dividing and reckoning time; hence the division into months (q.v.: see also WEEK) of 29 or 30 days was one of the earliest and most universal. But it would soon be observed that, for many purposes, the changes of the seasons were more serviceable as marks of division; and thus arose the division into years (q.v.), determined by the motions of the sun. It was soon, however, discovered that the year, or larger division, did not contain an exact number of the smaller divisions or months, and that an accommodation was necessary; and various not very dissimilar expedients were employed for an adjustment that should correct the error. The ancient Egyptians had a year determined by the changes of the seasons, without reference to the changes of the moon, and containing 365 days, divided into twelve months of 30 days each, with five supplementary days at the end of the year. The Jewish year consisted, in the earliest periods, as it still does, of twelve lunar months, a thirteenth being from time to time introduced, to accommodate it to the sun and seasons; this was also the case with the ancient Syrians, Macedonians, etc. The Jewish months have alternately 29 and 30 days; and in a cycle of 19 years there are seven years having the intercalary month, some of these years having also one, and some two days more than others have, so that the length of the year varies from 353 to 385 days.—The Greeks in the most ancient periods, reckoned according to real lunar months, twelve making a year; and about B.C. 594 Solon introduced in Athens the mode of reckoning alternately 30 and 29 days to the month, accommodating this civil year of 354 days to the solar year, by occasional introduction of an intercalary month. A change was afterward made, by which three times in eight years a month of 30 days was intercalated, making the average length of the year 365¼ days. See METONIC CYCLE.

The Romans are said to have had originally a year of 10 months; but in the times of their kings, they adopted a lunar year of 355 days, divided into 12 months, with an occasional intercalary month. Through the ignorance of the priests, who had the charge of this matter, the utmost confusion gradually arose, which Julius Cæsar remedied, B.C. 46, by the introduction of the JULIAN CALENDAR,

according to which the year has ordinarily 365 days, and every fourth year is a leap-year of 366 days—the length of the year being thus assumed as $365\frac{1}{4}$ days, while it is in reality 365 days, 5 hours, 48 minutes, and 50 seconds; or 11 minutes, 10 seconds less than the $365\frac{1}{4}$ days. Cæsar gave to the months the number of days which they still have.

So comparatively perfect was the Julian style of reckoning time that it prevailed generally among Christian nations, and remained undisturbed till the renewed accumulation of the remaining annual error of 11 minutes and 10 seconds had amounted, in 1582 years after the birth of Christ, to ten complete days, the vernal equinox falling on Mar. 11 instead of Mar. 21, as it did at the time of the Council of Nice, 325 years after the birth of Christ. This shifting of days had caused great disturbances, by unfixing the times of the celebration of Easter, and hence of all the other movable feasts of the church. And accordingly, Pope Gregory XIII., after deep study and calculation, ordained that ten days should be deducted from the year 1582, by calling the day which, according to the old calendar, would have been 1582, Oct. 5, 1582, Oct. 15, instead; and in order that the displacement might not recur, it was further ordained that every hundredth year (1800, 1900, 2100, etc.) should not be counted a leap-year, excepting every fourth hundredth, beginning with 2000. In this way the difference between the civil and the natural year will not amount to a day in 5,000 years. In Spain, Portugal, and part of Italy, the pope was exactly obeyed. In France the change took place in the same year, by reckoning Dec. 10 as Dec. 20. In the Low Countries, the change was from Dec. 15 to Dec. 25; but it was resisted by the Protestant part of the community until 1700. The Rom. Catholic nations in general adopted the *style* ordained by their sovereign pontiff; but the Protestants were then too much inflamed against the Latin church in all its relations, to receive even a purely scientific improvement from such hands. The Lutherans of Germany, Switzerland, and, as already mentioned, of the Low Countries, at length gave way in 1700, when it had become necessary to omit *eleven* instead of ten days. Scotland adopted the new reckoning in 1600. In England a bill to this effect was brought before the parliament, 1585, but did not get beyond a second reading in the house of lords; and it was not till 1751, after great inconvenience had been experienced from the difference of the reckoning for nearly two centuries, that an act was passed (24 Geo. II., 1751) for equallizing the style in Great Britain and Ireland with that used in other countries of Europe. It was then enacted that eleven days should be omitted *after* 1752, Sep. 2, so that the ensuing day should be Sep. 14. Russia, Greece, Roumania, and the minor countries belonging to the Greek confession, still adhere to the *old style;* an adherence which renders it necessary, when a letter is thence addressed to a per[illegible] in another

country, that the date should be given thus:—April $\frac{1}{18}$ or $\frac{\text{June } 27}{\text{July } 9}$; for it will be observed, the year 1800, not being reckoned in the Gregorian calendar as a leap-year, has interjected another (or twelfth) day between old and new style.

The C. of the French Republic was adopted in consequence of a decree of the national convention, 1793. The midnight preceding the autumnal equinox of 1792 was fixed upon as the new epoch, from which the years were to be reckoned as the Year One, the Year Two, etc. The year was divided into 12 months, each of 30 days, to which new names were given, as *Vendémiaire* (vintage month), *Brumaire* (foggy month), etc.; and instead of weeks, each month was divided into periods of 10 days, called *Primidi*, *Duodi*, *Tridi*, etc. Five *complementary* days were added at the end of each year, which were the *Féte du Génie*, *Féte du Travail*, etc. By Napoleon's command, this new system was abolished, and the use of the Gregorian C. resumed, 1806, Jan. 1.

CALENDAR, Jewish: The Jewish method of arranging the days of the year, based on lunar reckoning. It computes the days from evening to evening, according to the words of Gen. i. 5: 'And there was an evening and there was morning one day.' As the announcement of the appearance of the stars on Sabbaths, festivals and fasts, is an important element, and as the time between sunset and the appearance of stars varies in time and place, both observation and calculation are employed to determine the average period. As to the first meridian, the meridian ninety degrees East of Jerusalem was taken as the starting point. The day is divided into twenty-four equal hours, beginning at six P.M., which effects only the computation of the month's beginning (molad) and that of the four seasons of the year (tekufah). In Bible and Talmud the night is divided into three or four watches. Each hour is divided into 1,080 parts (halakim). The weekly Sabbaths are distinguished from each other by the readings from the Pentateuch or the Prophets each Sabbath (q. v.). The computation of the New Moon day was the duty of the head of the Sanhedrin, together with two of his colleagues. A permanent Calendar is ascribed to Hillel II. about 300, and is still in force.

As the lunar year is nearly 11 days shorter than the solar year, a month was added to the last month every two or three years, thus equalizing the difference. The resultant year is called leap-year. The first month, according to the Bible (Ex. xii. 2, xiii. 4; Deut. xvi. 1), must be in the Spring. The cycle of common and leap-years was permanently fixed by the calendar of Hillel. An important provision was to prevent the Day of Atonement being on Sunday or Friday, which would have interfered with the Sabbath, and that the seventh day of Tabernacles should not be on Saturday. In the cycle of 19 years, the 3d, 6th, 8th, 11th, 14th, 17th, and 19th are leap-years,

the rest common. The month has 29 or 30 days, while the year is divided into four equal seasons, whose beginning is termed 'tekufah.' While the smaller cycle of nineteen lunar years determines the sequence of common and leap-years, in the larger cycle of 28 solar years the 'tekufat' complete their course of variations as regards the hour of the day and the day of the week. Thus January 1st follows the same order every 28 years as regards the day of the week.

It is of interest to learn that while the names of the months were brought back to Palestine from the Babylonian captivity, thus suggesting Babylonian influences on the Jewish calendar, the necessity of fixing the dates of the festivals in Bible times made the study of astronomy necessary, so far as the moon's phases were concerned. In the era of the second Temple, the beginning of the month was announced to the country people and the inhabitants of Babylonia by fire-signals, which were readily borne from station to station in the hills. As Jews in Egypt, Greece and Asia Minor could not be reached by such signals, they celebrated two days as the new moon. In the era of Rabbi Judah the Holy (163-193), fire-signals were abolished and messengers employed, owing to the action of Samaritans who confused the Jews and led them into error by setting up signals at improper times. Here again as people in the country could not be reached so rapidly, they were in doubt, and celebrated two days of the holidays,—a custom still in vogue among strictly observant Jews. Among the rabbis who have influenced the calendar was Mar Samuel (about 165 to 250), who was an astronomer and arranged a calendar for 60 years, that the Babylonian Jews might be independent of Judaea. Under Hillel II. (330-365), owing to persecutions which made the Sanhedrin meet with difficulty, the calendar was fixed for all time. See Baraby, *The Jewish and Moham. Calendar* (London, 1901).

CALENDER, n. *kăl'ĕn-dėr* [so named from the founder:] in the *East*, one of a sect of dervishes.

CALENDER, n. *kăl'ĕn-dėr* [F. *calandre*, a calender, a mangle—from mid. L. *calen'dra*, an instrument for smoothing cloth—from L. *cyl'indrus;* Gr. *kul'indros*, a cylinder]: a press, consisting of heated rollers, between which cloths are passed to finish them off: V. to press between heated rollers. CAL'ENDERING, imp.: N. the process by which a thing is pressed and smoothed. CAL'ENDERED, pp. *-dėrd*. CAL'ENDRER, n. *-drėr*, or CAL'ENDER, n. *-dėr*, one who calenders cloths.

The familiar domestic processes of starching and ironing afford the simplest illustrations of the object and result of calendering. The domestic mangle effects the same object as the flat-iron, and is a near approach in construction to the calendering engines of the manufacturer, no traversing-box of stones being used in the new patent mangles.

The cylindrical calendering machine is said to have been introduced into England by the Huguenots, driven there by persecution. The cylinders were originally of wood, but the liability to warping is a strong objection to these.

The modern calender usually consists of four, five, or six cylinders or 'bowls' set vertically in a strong iron frame, with suitable driving gear, and furnished with weights suspended over a pulley to produce the required pressure. This sometimes amounts to, or even exceeds, 20 tons, including the weight of the rollers. In a five-roller machine, the arrangement is this: The centre roller is of iron or copper, made hollow for the admission of steam or a red-hot heater, the one immediately above and that directly below it are of paper; and the remaining two, one at the top and the other at the bottom, are of cast-iron. At least one of the rollers is always of paper, as it has more elasticity than metal, and is not liable to warp, like wood. It consists of sheets of brown paper or pasteboard, densely packed and compressed on an iron axis. The edges of these form the surface of the roller, which is turned and polished, an operation of some difficulty.

Before the final rolling in the calendering machine, the fabric is first lightly smoothed by passing over warm cylinders. Cotton goods are starched with a starch prepared from flour, and the starch is sometimes thickened with plaster of Paris, porcelain clay, or a mixture of these, to give a fictitious appearance of stoutness, which of course vanishes when the article is washed. For ordinary calendering the fabric is then simply passed between plain cylinders, which produces the desired effect by flattening the otherwise round threads. When, by means of a hot cylinder, with a pattern raised upon it, the amount of this flattening is unequal on different parts of the cloth, the beautiful effect known as 'watering' is the result. *Glazing* is produced by combined rubbing and pressure, the rollers, one of which is heated, being made to move with different velocities, so that one side of the fabric is rubbed as well as pressed by the roller whose surface moves with the greater rapidity. Before the invention of these rubbing cylinders, glazing was effected by rubbing the surface of the fabric with a polished flint. Machines similar in construction to the one above described, but with all the rollers of iron, and also called calenders, are used for rolling india-rubber into sheets for coats, shoes, etc.

CALENDS, *kăl'ĕndz* [see CALENDAR]: one of the divisions of the month, among the Romans. They used a threefold division of the month into *Calends*, *Nones*, and *Ides*. The C. always fell upon the 1st of the month; the Nones in March, May, July, and October, on the 7th; and the Ides on the 15th; and in the remaining months the Nones on the 5th, and the Ides on the 13th. The C. were so named because it was an old custom of the College of Priests on the first of the month to *call* (or assemble) the people together to inform them of the festivals and sacred

days to be observed during the month; the Nones received their name from being the *ninth* day before the Ides, reckoning inclusively; and the Ides from an obsolete verb, signifying to divide, because they nearly halved the month. This threefold division also determined the reckoning of the days, which were not distinguished by the ordinal numbers first, second, third, etc., but as follows: Those between the C. and the Nones were termed *the days before the Nones;* those between the Nones and the Ides, *the days before the Ides;* and the remainder, *the days before the C.* of the next month. Thus, the Ides of January, happening on the 13th of that month, the next day would not be termed by a Latin writer the 14th, but *the 19th before the C. of February*, reckoning inclusively, i.e., reckoning both Jan. 14 and Feb. 1, and so on to the last, which was termed *pridie Calendas.*

Ad Calendas Græcas, a Roman proverbial saying, practically equivalent to 'never.' The Roman C. were often appointed as days for the payment of rent, interest, etc.; but as the Greeks had no C., a postponement of payment *ad Calendas Græcas* simply meant a refusal to pay altogether. It is said that the Emperor Augustus frequently used the phrase, which afterward became a proverb.

CALENDULA, n. *kă-lĕn′dū-lă* [L. *calendæ*, the first day of the Roman month): a genus of plants including the common marigold, so named as species may be found in flower every month; the *C. officinālis*, ord. *Compŏs′ĭtæ.* Calenduline, n. *-lĭn*, a gummy extract obtained from the marigold used in medicine.

CALENUS, *ka-lē′nŭs*, Quintus Fufius: Roman consul: d. abt. B.C. 40. He served Cæsar as legate in Gaul, B.C. 51, was his strong partisan in the civil war, and was elected consul through his friendship, B.C. 47. After Cæsar's death C. commanded an army for Anthony in n. Italy, where he died.

CALENZIO, *kâ-lĕn′ze-o*, Eliseo: poet: b. Apulia; d. 1503. He was esteemed among the Latin poets of his time, became preceptor to Prince Frederick, son of Ferdinand II. of Naples, and was the author of many epigrams, elegies, and epistles.

CALEPINO, *kâ-lā-pē′no*, Ambrogio: philologist: 1435–1511; b. Bergamo, Italy. He spent his life in the composition of a polyglot dictionary; published first at Reggio, 1502, and after being enlarged by Passerat and others, at Basel, 1590, and Padua 1772.

CALESCENCE, n. *kă-lĕs′sĕns* [L. *calĕscens*, growing or becoming warm]: a growing warm.

CALF, n. *kâf*, Calves, plu. *kâvz* [AS. *cealf:* Ger. *kalb:* Dan. *kalv:* comp. Gael. *dhamb=căff*, with *c* guttural]: the young of the cow kind: a stupid or cowardly person; among *sailors*, a mass of ice detached from an iceberg. Calve, v. *kâv*, to bring forth a calf, as a cow. Calv′ing, imp. Calved, pp. *kâvd.* Calf′ish, a. *-ĭsh*, stupid. Calf-skin,

the skin of a calf dressed or made into leather. IN CALF, said of cows when with young.

CALF, GOLDEN: the idol of gold in the form of a calf, made by Aaron at Mount Sinai in compliance with the request of the Israelites when Moses did not promptly return from the mountain (Ex. xxxiii.), which caused so grievous a sin, has been made the subject of treatment both in rabbinical and Mohammedan literatures. In the former, the worship of the golden calf is regarded as the greatest sin, next to the fall of man, all of Israel's sufferings being in part retribution. The crime, it is said was due to Egyptian camp followers, forty thousand of whom, with two Egyptian magicians, persuaded the Israelites to the deed. In the Koran, a 'living, bellowing calf' was produced for the Israelites to worship, Samiri being introduced as the seducer, who is identified by Geiger as Samael, Mahomet making Samiri the scapegoat to gratify rabbinical prejudices against the Samaritans. See Weil's *Biblical Legends of the Muselmen;* Geiger, *Was hat Mohammed aus dem Judenthume Aufgenommen.*

CALF OF MAN [Gael. *calbh*, a headland]: the headland or cape of the Isle of Man, being a small island on its s.w. coast.

CALF OF THE LEG [Gael. *calp* and *calpa:* Icel. *kalfi*, the calf of the leg, the primary meaning being a lump]: the thick, fleshy part of the leg behind. CALVES OF THE LIPS, in *Scrip.*, the offering of the lips in praise and thanksgiving, figuratively as if the offering of a calf or bullock.

CALGARY, CANADA, city in the Province of Alberta, situated at the confluence of the Bow and Elbow Rivers, on the western division of the Canadian Pacific Railway, 840 miles west of Winnipeg, 620 miles east of Vancouver, and 2,260 miles west of Montreal.

Industries and Business Interests.—It is probably the chief distributing point of the two new provinces, there being 63 eastern wholesale houses established locally. It is the centre of the trade of a great ranching country and the chief source of supply for the mining districts in the mountains beyond. A considerable quantity of lumber is manufactured from logs floated down the Bow River. Amongst the chief industries are a soap factory, a cement works, two flour mills and elevators, one abattoir, two sash and door factories, a saw mill, a brewery and an artificial gas company. Calgary has also a considerable and growing live-stock trade and is the seat of branches of 13 of the chartered banks.

Public Works, Buildings, etc.—The value of the buildings, erected in 1905, was $1,300,000; there are 25 miles of plank side-walks, 11 miles of sewer lines, 17½ miles of water mains and three miles of concrete; the value of the water works plant is $250,000, and there are in the city two electric light plants—one owned by the municipality at a cost of $65,000, and the other by the Calgary Water-Power Company, at a cost of $90,000. There are five

churches and three large public school buildings, which cost $175,000. The Western Canada College is located here. There are also three hospitals, a sanitarium, an opera house, railway shops, municipal buildings and four parks.

Irrigation Interests in the Vicinity.—Between Calgary and Medicine Hat stretches a great tract of fertile but hitherto semi-arid territory, within which the Canadian Pacific Railway recently received the unallotted portion of its land grant, some 3,000,000 acres. This it proposes to make available by immense irrigation works, which are now under construction, and will when completed make available about 1,500,000 acres of irrigated land, while the adjacent unirrigated land will be used for pasture and other like purposes. The supply of water is drawn from the Bow River about two miles from Calgary and is conveyed northward and eastward. This main some 16 miles long terminates in a reservoir, about nine miles east of Calgary, which will cover about 800 acres, whence secondary canals, which will have a total length of 250 miles will convey the water through 500 miles of distributing ditches.

Population.—Incorporated in 1894, its growth in population has of late years been very great. In 1904 it was stated to have 6,500 people. The census of 1906 gives its population at 11,937.

CALHOUN, *kăl-hôn′*, John Caldwell: statesman: 1782, Mar. 18—1850, Mar. 31; b. Abbeville, S. C.; descended from an Irish family who founded the Calhouns' Settlement in S. C. Having gained distinction at the bar, he was sent to congress 1811, where he soon made himself the leader of the war-party against England. Author of the tariff of 1816, so favorable to his native state, he was named minister of war by President Monroe, 1817, and reduced the confused state of affairs in his department to order, and made a great reduction in the expenditure of the army without sacrificing its efficiency.

This early part of C.'s career was marked by broad and patriotic views; in after years he became a leading advocate of distinctively southern interests, though doubtless conceiving of these as involving the benefit of the whole country. The tariff of 1828 not being very favorable to the southern states, C. still adhered to the government, hoping that the president, Jackson, would veto the measure; but as this hope was disappointed, C. went to South Carolina, and there (1829) carried in the legislature the notorious resolution, 'that any state in the Union might annul an act of the federal government.' To this decision Virginia, Georgia, and Alabama gave in their adhesion, and threatened a dissolution of the Union. President Jackson promptly used energetic measures to make this resolution of no effect. C. lost popularity, and, despairing of reaching the presidency, resigned his vice-presidency, but soon afterward was elected to the senate. In 1838 he delivered his famous speech on slavery and continued to agitate on behalf of the slave-holding interest and for a

dissolution of the Union, both with voice and pen until his death at Washington. In his private character, C. was blameless; but in his career as a statesman he is understood to have implanted in the minds of his partisans those principles which culminated in the great war for the dissolution of the Union. He had a peculiar acuteness of intellect, and his convictions were positive. During many years, he had been employed in writing his work on *The Philosophy of Government,* in which he vindicates the doctrine of state sovereignty, and which, with other works, was posthumously published.

CALIBRE, or CALIBER, n. *kăl′ĭ-bėr* [Sp. *calibre,* bore, diameter, quality—from Ar. *kalib,* form, mold: F. *calibre* —from It. *calibro*]: the diameter of a body; the bore of a gun; capacity of the mind; the extent of mental or intellectual qualities possessed by any one. CAL′IBERED, pp. a. *-ĭ-bėrd,* measured with compasses called *calipers.* CALIBRATE, v. *kăl′ĭ-brāt,* to ascertain the calibre of; to determine and allow for irregularities of bore of a thermometer, and the like. CAL′IBRA′TION, n. *-brā′shŭn,* the act or process of ascertaining the calibre of.

CAL′IBRE, or CAL′IBER: technical name for the diameter of the bore of a firearm, whether a piece of ordnance or a small-arm. The ordnance from which solid shot are projected are generally denoted by the weight of each shot, as 24-pounder, 68-pounder, etc.; but mortars, and such guns as project shell or hollow shot, are usually denoted by the calibre, as 13-inch mortar, 10-inch shell-gun, etc. Of late years the calibre of ordnance is much larger than formerly. Calibre is used technically in reference to the diameter of firearms and of tubes generally, and is expressed in inches, as .22, .30, .45, calibre, meaning 22, 30, and 45 hundreths of an inch. For heavy guns, 1-inch, 2-inch, 3.2-inch, 5-inch, etc.

Certain classes of smaller cannon are designated as 1-pounders, 2-pounders, 6-pounders, etc., indicating the weight of shot fired. These generally refer to guns mounted on tripods, pedestals, etc., and are of the rapid fire class. Calibre for shotguns is termed *gauge* or *bore,* as 10, 12, 16, 20, 24 gauge or bore. The *gauge* is determined by the number of balls, the size of the bore, which will weigh one lb., viz; 10 gauge, in which ten balls the size of the bore weigh one pound; twelve such balls for a 12 gauge, etc. In inches the 10 gauge is (.79) seventy-nine-hundredths of an inch, the 12 gauge (.75) seventy-five-hundredths of an inch, etc. Sometimes the calibre of heavy ordnance is denoted by tons, as a 30-ton gun, a 100-ton gun, etc., but such designation is becoming obsolete.

Calibre is also sometimes used figuratively to designate intellectual capacity, as a man of broad calibre, meaning of a strong, intellectual character.

CALICE, n. *kăl′ĭs-ē* or *kăl′ĭs* [L. *calix,* a cup; *calice,* in or with a cup]: the little cup in which the polyp of a coralligenous zoophyte is contained.

CALICO, n. *kal'ĭ-kō* [from *Calicut* in E. Indies: F. *calicot*]: unprinted cotton cloth. CALICO-PRINTING, the art of dyeing cotton cloth, or covering cotton cloth with figures of various colors. CALICO-PRINTER, one who.

Calico-printing appears to have been practiced first at *Calicut* in India—hence the term *calico;* and the *pallampoors,* or large cotton chintz counterpanes, which have been manufactured in the East Indies for centuries, are evidence of the successful practice of the art in that country. From the East Indies the art spread to Asia Minor and the Levant, thence to Augsburg in Bavaria; whence, at the beginning of the 18th c., it spread to Alsace in France, to Switzerland, and ultimately to England and Scotland. The term is applicable strictly to the production of colored patterns on cotton cloth or calico; but as now employed, it includes all the processes followed in the formation of a colored pattern on cotton, linen, worsted, and silk goods, as also mixtures of two or more of these, such as the fabric called *de laine,* of cotton and worsted.

The first operation connected with the printing of cloth is the removal of the surface-hairs or minute threads which communicate a fibrous down or nap to the surface of the cloth, and if allowed to remain, would interfere with the uniform application of the colors. The surface down is disposed of by the process of singeing, during which the cloth is drawn over a red-hot iron or copper bar or plate, or through a series of gas jets. The apparatus generally used for *hot-plate singeing* consists of a furnace surmounted by a metal plate, which is sometimes ridged on the surface. The cloth having previously been joined at the ends, to make a long length, and been placed on a winch-roller, is first brought in contact with roller brushes, which raise the nap on the cloth, then passes oves the white-hot metal cylindrical bar; and is wound on to a second winch-roller. The process is repeated twice on the face of the cloth, being the surface to be printed on, and once on the back. *Gas-singeing* is accomplished by drawing the cloth through brushes, and then over a horizontal pipe, perforated with rows of small holes, or slit from end to end, so that the gas issuing therefrom burns as a narrow sheet of flame. The cloth is not only allowed to come in contact with the burning gas, but the flame is transmitted through the cloth, and a suction-apparatus is often placed immediately above, so as to draw the flame through more effectually. When well singed, the cloth undergoes the process of bleaching (q.v.), and is thereafter calendered: see CALENDERING.

There are several modes of applying the colors to cloth, and these are respectively named—1. The Madder style; 2. The Padding style; 3. Topical style; 4. Resist or Reserve style; 5. Discharge style; and 6. China blue or Pottery style. These various processes are at one in being intended to fix upon the cloth the different colors; but they differ from each other more or less in the several steps through which the cloth is passed, though occasion-

ally there is little or no difference; and at times, the cloth is treated by one method, and subsequently by another.

The *madder style* is that in which a certain fixing agent or mordant is printed on the cloth, which is then introduced into the coloring matter in a dye-vat, when the mordant, having an attraction alike for the fibre of the cloth and for the coloring matter, acts the part of glue or paste, and cements the color to the cloth. Originally, madder was the only coloring substance employed in this style; but in recent years by far the greater number of dye-stuffs, vegetable and animal, including cochineal, log-wood, etc., are attached to cloth in this manner. The fixing agents or mordants generally used are different strengths of *red liquor* (acetate of alumina), *iron liquor* (acetate of iron), and mixtures of these. These are thickened with wheat-starch, potato-flour, roasted starch or dextrine, and gum-arabic, so that the mordant may not run when it is placed on the cloth by the pattern-block or by the printing-machine. After the mordant has been imprinted on the cloth, the latter is hung in a warm, airy, room, where it can easily dry, yet where the atmosphere is moist. The result is, that the mordant is decomposed, the acetic acid is evolved, and the alumina or iron is left attached to the fibre of the cloth in the state of an insoluble sub-salt, which cannot be dissolved by water. As some of the mordant is still left in its original soluble condition, it is necessary to wash the cloth free from this, else, during the dyeing operation, the soluble part of the mordant would run on to those parts of the cloth not intended to be colored, and thus produce a blotted appearance. To obviate this, the cloth, having undergone the process of *drying and ageing*, is then introduced into a vat containing water, through which is diffused some cow-dung, dung substitute (a preparation of bone ash, sulphuric acid, carbonate of soda, and glue), or bran. The result of this process of *dunging* is the removal of the soluble part of the mordant, as also the starch or thickening agent, leaving the decomposed or insoluble mordant adhering to the fibre. The terms *dung*-fixing, *substitute*-fixing, and *bran*-fixing, have reference to the employment of one or other of these agents at this stage of the operation. When the cloth has been well washed from the dunging, it is introduced into the vat or dye beck containing the coloring matter. The whole is heated by steam-pipes, and the cloth being placed on a sparred reel kept in motion, is repeatedly wound out of the vat, and returned thereto. The result is, that wherever the mordant adhered to the cloth, the coloring matter is attached thereto, and little or no trace of color adheres to the unmordanted parts. The last operation is the *clearing* or *brightening*, during which the colored cloth is introduced into warm baths of water containing soda, soap, or, for the more delicate tints, bran, and is thereafter acted on by weak acid solutions. The object is to clear the colors, and at the same time to confer upon them the property of resisting the fading action of the air and sun for a much longer

time. The different shades of color which can be obtained from the same madder beck or vat, with different mordants, are very numerous, and include reds, lilacs, purples, chocolates, and blacks. Thus, when a weak solution of red liquor (acetate of alumina) is the mordant, a light red tint is procured; with a stronger aluminous mordant, a deep red is formed on the cloth; with a more or less dilute solution of iron liquor (acetate of iron), the cloth is colored lilac, violet, or purple; with a strong solution of iron liquor, black is obtained. Indeed, the same piece of cloth stamped in different places with the various strengths of aluminous and iron mordants, and mixtures of these, and immersed in the madder-bath, will be obtained dyed with all the shades mentioned; and in this manner, many of the beautiful variegated colored dresses and handkerchiefs are prepared for market.

The *padding style* is intended mainly for the impregnation of cloth, in whole or in part, with mineral coloring substances. When the cloth is to be entirely colored, it is immersed wholly in a vat containing the mordant. When the color is to appear as a pattern on the fabric, the mordant is applied by a pattern block, or by the printing-machine. In either case, the cloth is thereafter thoroughly dried, and washed in various solutions, and then introduced into a vat containing the substance to form the color. Thus, if a piece of cloth is to be entirely impregnated with *chrome yellow*, it is first treated or *padded* in a solution of 8 parts of bichromate of potash ($KO,2CrO_3$) to a gallon of water dried, and then placed in a vat containing a solution of 6 or 8 ounces of acetate or nitrate of lead (PbOA, or $PbONO_5$) to the gallon of water. The result is that the chromate of lead ($PbOCrO_3$) is formed in the tissue of the cloth; and when the latter is washed and dried, the yellow color still adheres to the cloth firm and fast. To print a yellow pattern on cloth, 7 to 9 ounces of acetate of lead, and the same quantity of nitrate of lead, are dissolved in a gallon of water, thickened with starch, and placed upon the cloth according to pattern. After drying, the cloth is first immersed in water containing a little carbonate of soda, and ultimately in a solution of bichromate of potash, when the pattern becomes fixed in bright yellow, insoluble in water. To produce *Prussian blue* on cloth, it is treated with acetate and sulphate of iron, dried, washed with warm chalk-water, and immersed in a very weak solution of yellow prussiate of potash. A pattern in Prussian blue is produced by printing a pattern in the cloth with the iron solutions thickened with gum, and thereafter proceeding as above. Chrome green is produced in a similar way, by using sulphate and acetate of copper, thickened with glue, and thereafter arsenious acid with potash; and so for other colors, such as iron buff or chamois, manganese bronze, etc.

The *topical style* is the process whereby certain coloring matters insoluble in water, therefore not to be applied to cloth by the modes suggested under the madder

and padding styles, are treated at once with the mordant, and the mixture by one operation transferred by block, or otherwise, directly on the surface or *top* of the cloth; hence the term *topical*. Indigo, safflower, and arnotto are instances of such insoluble coloring substances; and when these and other dye-stuffs, such as logwood and Brazil wood, are treated with water, thickened with starch and nitro-muriate of tin (known as *spirits*) added, with occasionally a little of other salts, such as nitrate of copper, the result is the formation of *spirit-colors*, which can be printed on the surface of cloth, and have a degree of fixity. The permanency of these *spirit-colors*, however, is much increased, and the general appearance improved, by afterward subjecting the goods to the action of steam in a wooden chest or box, when the term *steam-colors* is applied.

The *resist style* is that in which certain materials are placed on the surface of cloth, to protect it from the adherence of the mordants, and, consequently, to keep that part of the cloth from being attacked by the coloring matter. These materials are termed resists, reserves, or resist pastes, and they are divisible into mechanical and chemical. The *mechanical resists* are such substances as fats, resins, oils, wax, and pipe-clay. A common resist for silk and woolen goods is a mixture of 2½ of resin and 1 of suet; and it is principally in the color-printing of silk and woolen dresses and handkerchiefs that mechanical resists are used, though they are used occasionally for the printing of cottons. The chemical resists may act on the mordant or on the color. Thus, if it be desirable to remove the mordant, and thus leave certain parts of the cloth unable to attach color, the printing of a pattern with some acid substance on the cloth will form with the mordant a soluble salt, which can be readily removed by washing, while the parts not so acted on by acid are not dissolved away by the washing, and retain the full power in the color-vats to cause the adhesion of the color. For this purpose, where an iron or aluminous mordant has been employed, it is customary to print thereon in the requisite pattern, lemon-juice or lime-juice (containing citric acid), tartaric or oxalic acid, and bisulphate of potassa, or a mixture of two or more of these, thickened with pipe-clay, China-clay, gum-arabic, dextrine (British gum), gum-Senegal, or a mixture of these; occasionally, chloride of tin is employed. Sulphate of zinc, sulphate and acetate of copper, and the chloride of mercury are used to resist the adherence of indigo blue.

The *discharge style* comprehends the employment of similar materials to those used in the resist style, but *after* the cloth has been colored or dyed, and for the purpose of discharging the color, or bleaching the cloth at certain parts, according to pattern. The dischargers for organic coloring matters are chlorine and chromic acid. The chlorine is employed in the form of bleaching-powder (q.v.), and the cloth already dyed is printed with a solution of tartaric acid (or other acid), thickened with pipe-clay and gum, then dried, and passed through a solu-

tion of bleaching-powder, when the decoloration occurs: see BLEACHING. The chlorine is applied also by placing a number of folds of colored cloth between perforated pattern plates, and subjecting the whole to great pressure; a solution of chlorine (obtained by adding an acid to a weak solution of bleaching-powder) is allowed to percolate down through the perforations of the plates, and through the cloth immediately underneath, so that only those spots are bleached, while the rest of the cloth is so highly compressed as to keep the liquid from coming in contact therewith. The well-known Turkey-red handkerchiefs are *patterned* in this way. The chromic acid is generally employed in discharging indigo color. The cloth, already entirely blue, is soaked or padded in bichromate of potash and then an acid discharger printed thereon; and wherever the acid discharger (tartaric, oxalic, citric, or hydrochloric acid) comes in contact with the blue cloth containing the bichromate of potash, chromic acid is liberated and destroys the color. Instead of acting upon the colored cloth, the discharger may be employed to carry off the mordant. Thus, cloth treated wholly with a mordant, and thereafter printed with a pattern in acid, has the mordant removed at those parts where the pattern block has placed the acid. Mineral colors also can be discharged in a similar way.

The *China blue* or *pottery style* is a modification of the topical style, where indigo is deposited on cloth in the insoluble state, and is thereafter manipulated so as to impregnate the cloth with the indigo more or less strongly, and thus produce different shades of blue.

The above descriptions of the various operations in calico-printing have special reference to cotton cloth; and though many steps of the manipulative processes apply equally well to linen, silk, worsted, and delaines (worsted and cotton), yet considerable modifications in mode of treatment and material employed are required in color-printing of all texture containing animal fibre, such as silk and wool. For the essential difference in the process with such fabrics from the processes already indicated, see SILK: WOOL. The different coloring matters used in C. are identical with those used in dyeing: see DYE-STUFFS: for the mode of compounding these into the various colors and shades, see DYEING.

CALICULA, n. *kă-lĭk′ū-lă* [L. *calĭcŭlus*, a small cup—from *calĭcem*, a cup]: in *bot.*, several bracts in union at the base of the calyx, sometimes larger than the calyx itself. CALICULATE, a. *kă-lĭk′ū-lāt*, or CALIC′ULATED, a. *-lā-tĕd*, having the involucre at the base surrounded by a row of bracts like a calicula around a calyx.

CALICUT, *kăl′ĭ-kŭt*: seaport of the dist. of Malabar, which, though on the w. side of the peninsula of Hindustan, yet forms part of the presidency of Madras. In lat. 11° 15′ n., and long. 75° 50′ e., it is distant from Goa 300 m.; from Bombay, 566 m. It was the first spot in India visited by Vasco da Gama, being then the chief em-

porium on the coast, with stately dwellings and magnificent pagodas. So populous and powerful was it, that it twice repulsed the Portuguese, slaying their commander in 1509, and expelling Albuquerque himself, after a transient success on his part, 1510. It stands near the mouth of a small river of the same name, appearing to have had at one time a moderately good haven. Gradually, however, this harbor has been filled up with sand; and now its anchorage is merely an open roadstead, at a distance, for large vessels, of two or three m. from land. Independently of this physical disadvantage, the ravages of war and the competition of superior localities contributed to the decay of C. Accordingly, in 1792, when it fell into the hands of the English, the city was little better than a ruin. Since then, it has made considerable progress. From C., *calico* is understood to have derived its name, just as *cambric* from Cambrai, in the n. e. of France.—Pop. (1881) 57,085; (1891) 65,700; (1901) 75,510.

CALID, a. *kăl'ĭd* [L. *calĭdus*, warm]: hot; burning; ardent. CALIDITY, n. *kă-lĭd'ĭ-tĭ*.

CALIDIUS, *ka-lĭd'ĭ-ŭs*, MARCUS: Roman orator: d. B. C. 48. He was contemporary with Cicero and urged his recall from exile; became prætor in B. C. 57, and after the death of Clodius gave his adhesion to Milo. In the civil war which opened in 49 he rendered Cæsar valuable service, but did not live long enough to reap reward; his oratory was highly commended by Cicero.

CALIF: see CALIPH.

CALIFORNIA, *kăl-ĭ-for'nĭ-a:* a state, one of the United States of America. The name, in a wider sense, designates also a region on the w. coast of N. America, extending from lat. 23° to 42° n., of which the s. portion, the peninsula called Lower C., or Old C., or Mexican C., is a territory of the rep. of Mex. (see end of article). The n. portion, Upper C. (Alta Calif.), or New C., is one of the U. S., and is commonly referred to when the name C. is used.

Area, etc.—The state of C. is bounded on the n. by Oregon, on the e. by Nevada and Arizona, on the s. by the territory of Lower C. in Mexico, and on the w. by the Pacific Ocean. Its boundary-line upon the n. is the line of 42° n. lat., upon the e. it is the line of 120° w. long. to its intersection with that of 39° n. lat., thence s. e. to the Colorado river at 35° n., thence the course of that river to its intersection with the Gila; the s. boundary is a line thence to a point a league s. of the port of San Diego. The state has thus a length of about 770 m., extending from lat. 32° 30′ to lat. 42°, i. e., from the lat. of Charleston, S. C., to that of Newport, R. I. The breadth of the state is from 150 m. to 330 m., its average 230 m. It is the second state of the Union in size; land surface 155,980 sq. m., water surface 2,380 sq. m., gross area 158,360 sq. m. (101,350,400 acres); cap. Sacramento.

CALIFORNIA.

Topography.—The most conspicuous features of the topography of C. are two great parallel chains or masses of mountains, the Sierra Nevada in the e., near the boundary of the state to which it gives its name Nevada, and the Coast Range in the w., along the verge of the Pacific Ocean. C. has 120 peaks exceeding 8,000 ft.; 41 exceeding 10,000 ft., and 11 exceeding 13,000 ft. In the n. part of C. these two ranges join indistinguishably, and in the s. again, in the neighborhood of the Téjon pass, they become united into one chain, the San Bernardino range. But the central portion which is really the most important, is chiefly characterized by these two parallel systems and may be conveniently divided in consequence by five parallel lines, at distances of about 55 m in each case. The principal peaks of the Sierra Nevada (snowy range), of which the loftiest are never entirely bare of snow, are ranged very nearly in a straight line, running n. w. and s. e. for more than 600 m., its width being from 75 to 100 m., its base covering four times the area of Massachusetts. A line parallel to this, at a distance of 55 m. to the e., is found to be a line of depression occupied by lakes—about 1,500 in all, the lake line being at about 8,000 ft. and marks the e. base of the Sierra Nevada. A third line at similar distance to the w. would mark their w. base; a fourth, still further w., the e. foothills of the Coast Range; a fifth, their w. edge, and the border of the ocean. Between the third and fourth of these, i. e., between the Sierra Nevada and the Coast Range, lies the great valley down which, in the n. portion, flows the Sacramento river, and in the s. the San Joaquin. The highest peaks of the Sierra Nevada are Mt. Whitney, 14,898 ft. high at its s. terminus, and Mt. Shasta, 14,442 ft. at its n. terminus. Between, lie in succession from n. to s. Lassen's Peak, 10,577 ft.; Castle Peak, 12,500; Mt. Tyndall, 14,386; Mt. Brewer, 13,886, and Mt. Dana, 13,227. This range is the w. edge of the great continental upheaval or plateau which is the chief feature of the conformation of the w. part of the United States. It is, excepting the Alaskan mountains, the loftiest and most extensive of the mountain ranges which constitute the Cordilleras of N. America. Its passes average 12,000 ft., the lowest being 9,000 ft. and the most used (Kearsarge) 12,000 ft. The Coast Range, which rather closely follows the coast line from Oregon to Point Concepcion, is of much less altitude; in the portions near San Francisco it does not anywhere rise much above 4,000 ft., though at the extremities where it approaches its junctions with the Sierra Nevada, it attains an altitude in the highest points of 8,000 ft. The n. part of C. is entirely covered by the interlocking spurs of the two ranges which give it a very rugged character. The s. part is traversed by numerous broken ranges, and has a character of extreme sterility owing to the want of water. Yet a narrow belt along the coast of this s. portion is fer-

tile, exceedingly beautiful, and greatly favored in respect to climate.

The coast line of C. is rocky and good harbors are few. The bay of San Francisco forms the best and most capacious harbor on the w. coast of N. America, and one of the finest in the world. It is nearly 50 m. in length, with a breadth averaging 9 m., with good anchorage, deep water, and perfect shelter on all sides. Its entrance is a strait about 5 m. long and 1 m. wide, inclosed between high cliffs and called the Golden Gate. The bay is one of great beauty and is diversified by smaller bays opening into its n. end, and by numerous islands on one of which is the Mare Island Navy Yard of the United States government. Humboldt Bay on the n. part of the coast is the best harbor in that part. Southward from San Francisco are the bays of Santa Cruz, Monterey, San Luis Obispo, San Pedro, and San Diego, of which the last, at the extreme s. end of the coast, is next in importance to San Francisco Bay, both for security and for advantages of geographical position. Of the islands off the coast the rocky group called the Farallones, opposite the Golden Gate, have been of great importance as the resort of numberless sea-fowl, whose eggs have been collected there in great quantities. Off the s. coast are several much larger islands mostly occupied by large flocks of sheep.

The principal rivers of C. are the Sacramento and the San Joaquin. The course of both lies in the great central valley already mentioned. The Sacramento rises in Mt. Shasta and flows s.; the San Joaquin rises in the Tulare Lake in the s. end of the valley and flows n. Near lat. 38° they unite and flow w. into San Francisco Bay. Both have many small tributaries. The Sacramento, 370 m. long, is navigable 120 m. from San Francisco; the San Joaquin, 350 m. long, is navigable for steamers for about the same distance. In the n. part of the state the Klamath river, which has its rise in Oregon, flows w. into the Pacific. The Colorado which forms the s. e. boundary of the state is navigable 612 m. from its mouth. Of the numerous rivers of the Coast Range only one, the Salinas, flowing into the Bay of Monterey, is navigable. The river valleys and especially the central one, are in general the most favored parts of the state. Of the others, the Mad, Eel, Los Angeles, San Gabriel, Santa Ana, Feather, Yuba, Cosumnes, American, Mokelumne, Kern, Kings, etc., none are of any importance whatever as waterways, in instances simply being feeders for the larger rivers, but many of them are invaluable for irrigation purposes.

C. has several large lakes. The largest is Tulare Lake, at the s. end of the central valley. It is 33 m. long, and 22 m. wide. Upon the e. slope of the Sierra are several large mountain lakes. Most of these are alkaline and without outlet; some are little more than mud-flats, the sinks of interior rivers. Lake Tahoe, at the angle in the boundary of C. and Nevada, at an

elevation of about 6,200 ft., is a beautiful lake of exceedingly pure water; it is about 20 m. long, and 1,500 ft. deep. Another lake of great beauty is Clear Lake, in the midst of the Coast Range, n. of San Francisco Bay.

Scenery.—Much of the scenery of C. is fine in the extreme. An especial fame in this respect attaches to the Yosemite Valley on the w. slope of the Sierra Nevada. This valley is on the Merced river, in the e. part of Mariposa co., 140 m. in a straight line a little s. of e. from San Francisco. The valley is a nearly level area, about 6 m. in length, and from half a mile to a mile in width. It is almost a mile in perpendicular depth below the general level of the adjacent region, and is inclosed between granite walls rising with almost unbroken and perpendicular faces to a height of 2,000 or 3,000 ft. From the brow of the precipices in several places spring streams of water which, in seasons of rain and melted snow, form cataracts of singular beauty. One of these has a total height of not less than 2,600 ft., divided into three parts, but having one fall of 1,500 ft. The scenery of the valley is magnificent, and scarcely surpassed anywhere in the world. The valley has been granted to the state of C., together with the Mariposa Grove of Big Trees, on condition that they be kept for public use, resort, and recreation, and that they be inalienable for all time. Other valleys and cañons in the Sierra Nevada present scenery of remarkable beauty.

Climate.—C. presents a great variety of climates, but almost all are remarkably equable and fine. Extreme heat and cold are almost unknown in all; yet there exist great contrasts in respect to temperature between places separated from each other by but a short distance. The climate of the interior regions is hot and dry; the sea-shore climate cool and moist. The latter derives its low temperature from the ocean, the water of which, along the coast, is kept at from 52° to 54° all the year around, by reason of a steady current from the n. and northerly winds prevailing during the summer. These bring daily supplies of cool, damp air upon the coast regions. The valleys around the bay of San Francisco partake of both climates. No climate in the world is more delightful than that of these districts (save for the dustiness which results from slightness of rainfall) and of the s. coast districts.

At San Francisco the temperature sometimes does not sink to the freezing point during the whole year, and on the other hand figures taken during 17 years showed but six days on which it rose above 90° F. The mean temperature of the coldest months, Dec. and Jan., is 50° (55° and 56° at noon), that of the warmest, Sep., 60° (69° or 70° at noon). The yearly mean is 55°. As one recedes from the ocean, the days are warmer and the nights colder. It is a noteworthy anomaly, that in the nine degrees of latitude from the mouth of the

Columbia to Monterey, the mean temperature varies but little—not more than three or four degrees at most. But the interior climate varies indefinitely; indeed, every valley has a climate of its own; the summers are generally hotter in the n. The sudden fluctuations of temperature so conspicuous in the climate of the Atlantic states are unknown in California. In the summer months there is scarcely any fall of temperature through the night in the coast climate, and not much in the interior. The Colorado desert, in the s.e. corner of the state, has an extremely hot and dry climate, Fort Yuma being probably the hottest place in the United States. On the other hand, certain of the n. valleys, bordering on Oregon, have a winter climate of great severity.

Except in Dec. and Jan. the prevailing wind is a sea-breeze from the w. There are also dry land-winds from the n. The stormy winds are usually from the s. Throughout California the 'rainy season' is confined to one portion of the year, approximately from late October to late April, with 15 or 25 rainy days, and for the six months following April, rain is practically unknown, except showers in the high mountain regions, but both the amount of rain-fall and the length of the rainy season diminish as one approaches the s. part of the state, and as one recedes from the mountains. At San Francisco the mean amount of rain-fall is 23.53 in., though the variations are considerable. The regions around the bay give much the same figures; in some localities in the Sierras it is three or four times as great; at Los Angeles 14.56 in. and at San Diego and Monterey it is but 10 or 12 in. December is the month of greatest rain, and winter is the rainy season, so far as there is any. The rains are sudden and showery, as in the tropics. Snow is rare; hail falls a few times in the winter; in the Sierras there are, of course, heavy snows, the annual fall averaging from 30 to 50 ft. In southern California the warm and dry air is exceedingly healthful and favorable to invalids, particularly consumptives. Monterey, San Diego, San Bernardino, Los Angeles, and Santa Barbara, have become famous winter sanitariums. The death-rate in California is comparatively low.

Fauna.—The fauna of California includes over 100 species of mammals, but of these the larger game varieties have been nearly exterminated within the last half century. Of carnivora, the grizzly bear (*ursus horribilis*) and the black bear (*ursus Americanus*), the cinnamon and the brown bear, are among the most noteworthy. The former, formerly very common, has now become greatly diminished in numbers. There are other species of carnivora peculiar to the Pacific slope. The fisher and the American sable or marten, are occasionally found in the high Sierras. Seven species of foxes are known. Sea-lions frequent rocks and islands near the sea-shore, and fur-seals occasionally appear at the Farallones. The beaver, once in vast numbers here, is now confined

A GIANT SEQUOIA TREE.
Largest in the world. Circumference 109 ft.)

to the remotest mountain streams, and the sea-otter is almost extinct, but this gray ground squirrel or spermophiles, five species of gopher, jack-rabbits, and cotton tails are so numerous as to be pests to the farmers. The sewellel, or mammoth-mole, resembling the beaver, but without a tail, is an animal peculiar to this coast. Gophers are numerous, and troublesome to farmers. The elk is found in the forests of the n. countries; there are several varieties of deer, the black-tailed deer (*cervus Columbianus*) being the most common. Antelopes were formerly found in large herds in the dry plains and valleys, but they have hardly a representative left; the same is true of the mountain sheep (*Ovis Ammon*) or 'big horn,' once common in the higher parts of the Sierra Nevada. All the orders of birds common to temperate climates are well represented, there being about 350 species; there is little migration among them because of the equable climate. The C. vulture (*cathartes Californianus*) is remarkable as the largest land bird that flies n. of the Andes. Humming-birds frequent C. more than any other state. Grouse and quails, or partridges, geese, and ducks abound. There are no venomous reptiles except rattlesnakes. Lizards are more fully represented than in any other state. C. is well supplied with fishes, in marine and fresh-water fish being one of the richest states of the Union. Salmon, smelt, halibut, sturgeon, mackerel, Spanish mackerel, rock-fish, soles, tom-cod, pompano, sand-dab, barracouda, red snapper, and the leaping tuna (the most gamy) are plentiful, and trout of all varieties, black bass, shad, carp, and catfish have been successfully introduced and are now caught in large numbers. Of shell-fish there are crabs, shrimps, crawfish, oysters, clams, cockles, mussels, razor-shells, etc.

Flora.—The flora of C. is extensive, including about 2,500 species, and in many respects peculiar, since the ocean on the one hand and the lofty Sierra Nevada on the other have in a measure shut out from it the vegetable species of other regions. The variety and abundance of wild flowers is extraordinary, though in general they are not remarkable for fragrance. Many of the plants of the state have a medicinal value. The grasses, though abundant and valuable for pasturage, are in most cases not well adapted for making hay. Many fine fruits are indigenous, and attain large size. The rapid growth of California vegetation is worthy of remark. The forests of the state claim chief attention. The forest trees are of numerous species, some of which —as the mammoth, or big tree (*sequoia gigantea*) and the Monterey cypress (*cupressus macrocarpa*)—occur nowhere out of C. The heavy forests are confined to the Coast Range, the Sierra Nevada, and the group of mountains joining these two ranges in the n. part of the state. The principal trees of the Coast Range forest are the redwood and the red fir. The chestnut oak is

common in the n. part of the state. The most valuable forest region of the w. slope of the Sierra Nevada is a belt between the altitudes of 4,000 and 8,000 ft. Sugar pine, yellow pine, and red fir are the chief trees in these forests. The 'big trees' occur in small, scattered groves in the s. part of this belt. Below this elevation, upon the slope, are pine forests of minor economic importance, while the great valley between the two ranges is largely covered with an open growth of oaks. The e. slope of the Sierra is covered with heavy forests, mostly of yellow pine. The n. e., s., and s. e. parts of the state are for the most part bare of forests.

The narrow belt of redwood which covers the w. slope of the Coast Range from the n. boundary of C. to the Bay of Monterey is the most important forest of similar extent now standing. Few trees equal the redwood in economic value. No other forest has so great productive capacity, and no other great body of timber in N. America is so accessible and so easily worked. An especial interest attaches to the *Sequoia gigantea*, the largest tree of the American forests, the oldest of anything growing on the earth, and surpassed in height by the Australian eucalyptus only. The 'big tree' occurs only in C., averages 275 ft. high and 25 ft. in diameter, the largest being 325 ft. high, 38 ft. in diameter and about 5,000 years old. Other large trees are the sugar pine, 245 ft. high and 18 ft. diam.; the yellow pine, 220 ft. high and 8 ft. diam.; the white silver fir, 200 ft. high and 6 ft. diam.; the Libocedrus, or incense cedar, 150 ft. high and 7 ft. diam.; the Douglas spruce, 200 ft. high and 6 ft. diam.; etc. There are also the nut pine or piñon, many varieties of oaks, maples, birches, yews, alders, cotton-woods, aspens, sycamores, madroños, etc., fruit, shade and ornamental trees, over 10,000,000 Australian eucalyptus, and millions of 'pepper-trees' (*Molle*) from Peru, used in the streets.

Geology.—The central mass, or core, of the Sierra Nevada is chiefly granite; this is flanked on both sides by metamorphic slates, and capped irregularly by vast masses of basaltic and other kinds of lava, and heavy beds of ashes and breccia, giving evidence of prodigious activity of the subterranean volcanic forces in former times, though these are now dormant, or appear only in occasional earthquake shocks. The granite belt widens to the southward, and, in the highest portion of the Sierra, has a breadth of nearly 40 m. Northward, the amount of volcanic matter increases, and above Lassen's Peak it covers the whole width of the range, forming a vast high plateau, on which are many conical peaks, having, in many cases, well-formed craters still visible upon their summits. These craters now exhibit no signs of activity; but hot springs are plentifully distributed along the line of former volcanic action. In the central part of the state some of the highest peaks, including Mt. Dana, are made up of slates and metamorphic rocks. The Coast Range is composed of newer

geological formations than the Sierra, and they have been subjected to great disturbances down to a very recent geological period. No rocks in the Coast Range are older than the Cretaceous period. Strata of this and the Tertiary age make up nearly their whole body, with some masses of volcanic and granitic materials, though neither forms anything like a central nucleus. Sandstones and highly bituminous shales are the chief formations here.

Earthquakes are somewhat frequent, one or more shocks being felt nearly every year; but these are seldom very destructive. Shocks of great violence were felt in 1812. In 1865 considerable destruction was effected in the region around the bay of San Francisco, and in 1872 there were violent disturbances of the whole region of the Sierra Nevada. Very few lives were lost in these cases. In 1906, April 18, occurred the greatest earthquake ever experienced on the Pacific coast, in which San Francisco (q.v.) was almost entirely ruined. See *History*.

Minerals and Mining. — The mineral resources of C. are extremely varied, at the same time showing a very unequal relative importance. The gold production of the State is of sufficiently great amount to be an essential feature in determining the relations of the mediums of exchange throughout the world. The quicksilver production of C., although of much less value, represents about two-fifths of the total production of the world. This is of importance not only of itself, but also as a necessary means to the production of the precious metals. The coal fields, though not among the best, furnish a large part of the supply necessary for home consumption. Lead is incidentally obtained in silver mining, while both copper and iron are abundant. Tin, chromic iron, black oxide of manganese, soda, turquoise, fullers' earth, asbestos, graphite, platinum, tourmaline, antimony, magnesite, and other useful minerals also occur. C. furnishes about one-fourth of the total gold production of the United States, while it has been estimated that its annual production amounts to about one-seventh of the gold-yield of the world. The total amount of the gold production of the State up to the present time reaches almost to $2,000,000,000. Mining and washing for gold had its inception in C. in the year 1848, and the product reached its maximum value in 1853, when it was worth $65,000,000. Since that time it has been steadily declining. Its first phase consisted of the working of shallow placers by individual miners. The continued and energetic work under this system soon exhausted the most abundant supplies, whereupon, beginning in 1851, the high gravels and quartz veins were attacked. Since that time these have formed the chief sources of supply. With every advancing year improved ma-

chinery and more and more scientific methods of carrying on the work are being introduced, in order to successfully cope with the increasing difficulties, so that to-day the work is done mostly by companies with large capital.

The product of silver in the State is of growing importance. In this respect the State always stands among the first ten of all the States and Territories, its annual silver product averaging somewhere in the vicinity of $2,000,000. The abundant deposit of quicksilver with which C. is supplied is particularly advantageous for the gold and silver mining industries. The only important ore is cinnabar, which is found in a great number of localities in the Coast Range for 100 or 150 miles both to the n. and s. of San Francisco. Iron ores are found in numerous localities throughout the State, while the yield of copper ores reaches an annual value of almost $6,000,000. Among the many other mineral resources of C. borax in included, the yearly output of that product being well over 20,000 tons and sometimes mounting up to almost $1,000,000 in value. The production of salt, chiefly by means of evaporation, has been attaining large dimensions lately, so that this State ranks well in such production. Valuable beds of asphaltum are to be found in many places, the most important being in the vicinity of Los Angeles, which cover an area of 60 acres and have great depth. Bitumen occurs largely, while there is an increasing production of petroleum. Building stone of excellent quality, including granite, basalts, and sandstones, is also found in abundance in the State. Numerous mineral springs also exist, many of which are justly celebrated.

Agriculture. — The agriculture of C. is distinctive in that great attention is there given to crops not produced in the United States at large. Constantly increasing attention has been given to horticulture, and the State excels in its grapes, pears, peaches, plums, prunes, apricots, nectarines, cherries, figs, olives, oranges, and lemons. The exportation of fresh fruit, fruit-drying, the raising of nuts, the canning of fruit, the making of wine and brandy, and the production of raisins have also been increasing with remarkable rapidity. Dairy-farming is practiced extensively in many regions of the Coast Range, while the raising of live-stock, particularly sheep, which nowhere multiply more rapidly than in the valleys of C., is an important industry. Numerous ranches are maintained for this purpose, many of them being well over 100,000 acres in extent. Bee-culture and honey-making are also yearly assuming more and more importance. The staple crops, such as corn, wheat, oats, etc., are grown in California, there being altogether about 100,000 farms in the State.

Manufactures. — There are well over 7,500 manufacturing establishments in the State, the leading industry being canning and preserving fruits and vegetables, followed in turn by slaughtering and meat packing, flour and grist mill products, lumber and timber products, foundry and machine shop products, and liquors.

Commerce. — San Francisco is the chief port of entry, although there are many minor ones along the coast. Numerous lines of oceanic steamers run to China, Alaska, Mexico, Panama, Chile, the Philippines, Sandwich Islands, etc., besides the many lines of river steamers. The exports from San Francisco amount to about $50,000,000 annually, and the imports to about $40,000,000.

Railroads. — The most notable railroading advance in C. came in 1869, when transcontinental communication was established. To-day the State is directly or indirectly connected with the eastern States by several different lines, while railway building within the State is continuing on a large scale, nearly 10,000 miles being in operation. There are also about 50 different lines of street railways, all growing rapidly.

Finance. — The total bonded debt of C. is $4,881,500; the total assessed valuation, $2,373,897,092; and the tax rate $3.53 per $1,000.

Banks. — Including national, savings, and private, there are upwards of 400 banks in C., besides nearly 200 building and loan associations. San Francisco is a leading clearing-house centre, with Los Angeles not far behind.

Religion. — The predominating denominations are the Roman Catholic, Methodist, Presbyterian, Congregational, Baptist, Protestant Episcopal, and Methodist Episcopal, besides which there are many Chinese religious organizations.

Education. — C. has a highly perfected public school system, with approximately 350,000 pupils and 11,000 teachers, besides co-educational colleges and universities, female seminaries, colleges and universities for men only, schools of technology, law, and medicine. The two great universities are the U. of C., at Berkeley and San Francisco, and the Leland Stanford, Jr. University, at Palo Alto.

Charities and Corrections. — C. has two State prisons, 5 insane asylums, besides asylums for the deaf, dumb, and blind, industrial reform schools, and numerous public and private hospitals, asylums, orphanages, etc.

Government. — The suffrage is given to all male citizens of 21 years of age, with certain qualifications as to residence and registration. The Governor is elected for a term of 4 years, as are the other chief executive officers of the State. The Legislature consists of a Senate of 40 members and a lower house of 80,

the former being chosen for four years and the latter for two. The biennial sessions of these bodies, limited to 60 days, are held at Sacramento. The Supreme Court consists of 7 judges, elected by the people for terms of 12 years. The State is represented in Congress by 2 Senators and 8 representatives, and enjoys 9 electoral votes.

The successive govs., with their terms of service are as follows:

Spanish.

Gaspar de Portala	1767–71	Jose J. de Arrillaga	1792–94
Felipe de Barri	1771–74	Diego de Borica	1794–1800
Felipe de Neve	1774–82	Jose J. de Arrillaga	1800–14
Pedro Fajes	1782–90	Jose Arguello	1814–15
Jose A. Roman	1790–92	Pablo V. de Sola	1815–22

Mexican.

Pablo V. de Sola	1822–23	Nicolas Gutierrez	1836
Luis Arguello	1823–25	Mariana Chico	1836
Jose M. de Echeaudia	1825–31	Nicolas Gutierrez	1836
Manuel Victorio	1831–32	Juan B. Alvarado	1836–42
Pio Pico	1832–33	M. Micheltorena	1842–45
Jose Figueroa	1833–35	Pio Pico	1845–46
Jose Castro	1835–36		

United States.

John D. Sloat	1846	Stephen W. Kearney	1847
Robert F. Stockton	1846–47	Richard B. Mason	1847–49
John C. Fremont	1847	Bennet Riley	1849

State.

Peter H. Burnett	1849–51	William Irwin	1875–79
John McDougall	1851–52	George C. Perkins	1879–83
John Bigler	1852–56	George Stoneman	1883–87
J. N. Johnson	1856–58	Washington Bartlett	1887
John B. Weller	1858–60	R. W. Waterman	1887–91
Milton S. Latham	1860	H. H. Markham	1891–94
John J. Downey	1860–62	James H. Budd	1894–98
Leland Stanford	1862–63	Henry G. Gage	1898–02
Fred F. Low	1863–68	George C. Pardee	1902–06
Henry H. Haight	1868–72	James N. Gillett	1906-10
Newton Booth	1872–75	Hiram W. Johnson	1910-

Population.—(1850) 92,597; (1860) 379,994; (1870) 560,247; (1880) 864,694; (1890) 1,208,130; (1900) 1,485,053; (1910) 2,377,549.

History.—The name C. seems to have been borrowed from a Spanish romance of chivalry, *Las Sergas de Esplandian*, published first, Madrid 1510. In relating the exploits of Esplandian, son of Amadis of Gaul, the romancer in one passage describes a marvellous island called California, lying to the right hand of the Indies. The name was first applied to Lower C., soon after its discovery. Lower C. was discovered by men sent out by Cortés, 1534. Upper C. was visited first by Juan Cabrillo, 1542-43. In 1579, Sir Francis Drake visited the coast in his famous voyage around the world. No settlement was made until, in 1769, an expedition from Mexico founded San Diego, its purposes being both occupation and settlement on the one hand, and the propagation of Franciscan missions on the other. In 1775, the mission at San Francisco was founded. The

missions advanced rapidly, and increased in material prosperity; they were admirable in intention, though their converts were not stimulated to independence and self-help. A few foreigners, French, English, and American, touched upon the coast before the close of the century. In 1812, the Russians coming from what was then Russian America, founded on the n. part of the coast a small colony which remained till 1841. In 1822, Mexican independence was proclaimed in C., and the first provincial legislature was chosen; but throughout the whole succeeding period the subjection of the province to the Mexican government was often not much more than nominal. The Californians showed themselves jealous of all Mexican interference, quarrelled with the Mexican governors, and in 1836 by revolution put themselves in a position of virtual independence, under a Californian governor, Alvarado. By 1840 the white population of the 'department' had increased to 5,780. The rest of the political history of C., to the time of the conquest by the 'Americans,' is one of petty quarrel and intrigue; there was especial dissension between the n. and s. districts. Meanwhile the estates of the missions had been to a large extent secularized, and the church ceased to be a power. The Californians were engaged mostly in raising cattle for the hides and tallow. They were a simple-hearted people, with the gay sociability, grace, and geniality of southern Europe, unprogressive, and not altogether strong in character, though in general moral and law-abiding. A few hundred Americans were in the country at the end of the period, some in the regions of the coast, where they were well received by the Californians, some in the separate settlement, founded by Sutter, a Swiss, in the Sacramento valley. In 1842, Commodore Jones, of the U. S. navy, acting on a mistaken report of hostilities between the United States and Mexico, seized the port of Monterey, but on better information at once withdrew.

The United States did not cease to desire the acquisition of C. The story of the movements which brought about that acquisition is complicated, but may be summarized as follows. In 1845, Capt. John C. Frémont, of the U. S. topographical engineers, who had already distinguished himself in remote western exploration, set out with a well-armed party of 60 men to do topographical work in C. A quarrel occurring (1846) between this party and the Californians, General José Castro, commander of the latter, ordered Capt. Frémont to depart. The latter intrenched himself, but soon retreated to the n. of C. Here he was found by Lieut. Gillespie, who brought him private letters from Washington. It has also been supposed that he brought him orders from the government there, which were the cause of the course immediately pursued by him, the seizure of C. by force of arms.

It now appears, however, that on the contrary our government's efforts were at that time directed to the acquisition of C. by peaceful intrigue, through our consul at Monterey, with the inhabitants, who were to be induced first to make themselves independent of Mexico and then to seek annexation to the United States. Soon after Capt. Frémont had received his letters, in which perhaps his subsequent course was suggested by his father-in-law, Senator Benton, troubles arose between the American settlers in the Sacramento valley and the Californians; these were caused by aggressions of the Americans, who next seized prominent Californians, proclaimed a government of vague program, called the Bear-Flag Republic, and at once received the support of Frémont. Soon after this, war between the United States and Mexico began, and 1846, July, Commodore Sloat, U. S. N., raised the American flag at Monterey. The unprovoked and unauthorized attack on C. thus became a part of the Mexican war.

Capt. Frémont, Commodore Stockton, successor of Sloat, and Gen. Kearny, who advanced into C. from New Mexico, completed its conquest before the end of the year, meeting with little effectual resistance. The Californians rose once in revolt, but were finally defeated early in 1847, in the battle of San Gabriel, near Los Angeles. It was highly unfortunate for the mutual relations of the two races in the future that the acquisition was brought about by conquest, and not by peaceable methods. By the treaty of Guadalupe Hidalgo, 1848, C. was ceded to the United States. Just before the treaty was agreed upon, a discovery was made which vastly enhanced the value of the acquisition. In 1848, Jan., as a saw-mill near where Coloma now is, and belonging to the Sutter already mentioned, was being constructed, one Marshall, superintending the work, accidentally discovered particles of gold. It was found that the soil of these parts of C. was rich in gold. No gold mines of such productivity had been seen in the world before. The Americans already in C. crowded to the diggings, large amounts of gold were obtained, and C. immediately became a different country. At first the news of the discovery was hardly believed in the eastern states (though Humboldt had predicted such discoveries, and some small washings had been carried on since 1841), but soon, early in 1849, a great excitement broke out. From all parts of the country men flocked to C., by steamers *via* the isthmus of Panama, by sailing-vessels around the Horn, and by overland trains. Great numbers also came from Europe; the population, which in 1846 was probably less than 8,000, rose to 93,000 in 1850, and San Francisco, from a small village, became a thriving city.

Great moral and social difficulties arose from this

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influx. The exciting pursuits of mining and speculation attracted many rough, lawless, and even criminal men, and a condition almost approaching anarchy was the result. This alarming state of things was aggravated by the peculiar governmental status of the newly-acquired territory. Congress had not found opportunity to establish any civil government for it, because of the difficulty of deciding whether slavery was to be admitted into it or not. In the autumn of 1849 the people, resolving to act for themselves, framed a state constitution, and applied to congress for admission as a state. This constitution forbade slavery and delays therefore occurred; but in 1850, as a part of Mr. Clay's compromise measures, it was provided that C. should be admitted as a free state. But severe struggles were necessary before the social order could be satisfactorily restored. Lynch-law was persistent in the mining-camps. Twice in San Francisco, 1851 and 1856, vigilance committees of prominent citizens were organized as the one means of coping with the lawlessness and other evils of the city. Since the restoration of order, the chief events in the history of the state have been the establishment of connection with the east, already described, the growth of industries other than mining, especially of agricultural industries, the anti-Chinese agitation, and the adoption in 1879 of a constitution embracing many provisions hostile to the interests of corporations.

Following the gold excitement came another sensational era in the history of C.—the great bonanza silver period from 1859 to 1880. The most sensational part of the operations was the stock-gambling in San Francisco (the mines were in Nevada but were owned in San Francisco), which assumed enormous proportions, stocks on the board rising $1,000,000 a day for many months and the sales in one year amounting to $120,000,000. The 'Consolidated Virginia' mines paid dividends of $1,000,000 per month for nearly two years; one lode was valued at nearly $400,000,000, and $250,000,000 was spent in 'developing' a small group of hills. By 1875, San Francisco, then a city of only 200,000 population, had over 100 millionaires, but more sober methods of gold mining soon created a decadence in these great bonanzas, and the population soon turned their attention to agriculture, which soon became the real source of wealth of the state. A few years later, however, another craze swept over the state—the great 'land boom' of southern California 1886–7, as great a South Sea bubble as the Comstock silver stock craze. The chief places where the operations were most widely carried on and the greatest excitement was prevalent were in Los Angeles, San Diego, and San Bernardino counties, but the total area involved was as large as New England. Numberless thousands of city lots were laid out far from

towns; hundreds of miles of cement sidewalks and curbs were laid; scores of hotels and other buildings were erected; and great quantities of land (purchased at from $10 to $30 per acre) were sold as town lots at $1,000 to $10,000 per acre. At times as much as $250,000 was realized in a single day from the excursion auction sales of new 'towns;' and as much as $100 was paid simply for the privilege of standing in line to await the opening of the sales. This state of affairs, however, could not have of necessity lasted much longer, and in 1888 the gigantic bubble collapsed, but not with the disastrous results generally expected. There was not a single failure of any bank or business house of good standing, and values reverted to their former sane level, though all valuable real estate, both rural and urban, has constantly advanced in price each year, consequent upon the increasing immigration. In 1906, April, occurred the greatest calamity which C. has ever been called upon to endure—the earthquake of the 18th and the fire which raged for three days and consumed a greater part of San Francisco. Surrounding cities, towns and villages likewise suffered an incalculable amount of damage, Berkeley, Los Angeles, and Palo Alto being among the heavy losers. Many of the handsome buildings of the Leland Stanford Jr. Univ., (the library, memorial hall and others) were almost totally wrecked and the University of California at San Francisco also suffered about equally. The earthquake began about five o'clock on the morning of the 18th and lasted for 55 seconds, the shocks tumbling over many of the less substantial buildings, but doing comparatively little damage to the buildings of modern design and construction. The greatest havoc was created by the fire, which started immediately afterward in the debris. Soon gaining headway (the water-mains had been rendered useless by the earthquake and the fire department was powerless to act without water), the flames spread over the business section of the city despite the efforts to check them by blowing up rows of buildings with dynamite, and gradually consumed business blocks, handsome hotels and residences, the beautiful city hall, which cost $7,000,000, newspaper buildings, and finally reached Telegraph Hill, but was checked at Van Ness ave. No exact statement of the loss of life or property can be made, but it was estimated that there were between 700 and 1,000 lives lost and a property loss of between $200,000,000 and $300,000,000 in San Francisco alone, while if to this amount be added the loss sustained throughout the whole state, it would probably have been $350,000,000. Only about 5 per cent. of the damage was caused by the earthquake, the rest, 95 per cent., by fire. The city was immediately put under a guard of United States troops, supplies rushed there by the War Department at Washington and

from many other places, and from all over the United States, Canada and even from foreign nations came a flood of money contributions perhaps never before equalled anywhere in this country or in the world, the total amount being many millions. The parks of the city were thrown open to the public, supply stations established by the military authorities and food given to those unable to purchase it. The city soon became a camp of tents, but continued to be the same well-regulated community as before the shock. With wonderful rapidity the ruins were cleared away and building operations begun.

CALIFORNIA, Gulf of: an arm of the Pacific Ocean, which divides the peninsula of Lower California from the rest of Mexico. It was known originally as the Sea of Cortez, having been discovered under his auspices, and explored by him; and it has, from its shape, been occasionally designated the Adriatic of the new world. It is 700 m. in length, and varies in width from 40 to 100 m. At its n. extremity, it almost touches the territory of the United States, receiving therefrom the united streams of the Gila and the Colorado. The gulf contains many islands, particularly towards its head, and has long had a pearl-fishery. At the east side of its entrance stands Mazatlan, on a river of the same name, now the most frequented port of the neighboring regions.

CALIFORNIA, Lower (*Baja California*): a territory of the republic of Mexico. It consists of a long and narrow peninsula extending s. between the Pacific Ocean on the w. and the Gulf of C. on the e.; about 750 m. long and of varying breadth; 61,562 sq. m. Its s. extremity, Cape San Lucas, is in lat. 23° n. The territory is largely occupied by mountains. The climate is exceedingly arid, the soil mostly a sandy or stony waste. Yet there are, here and there, valleys of great fertility, and valuable mineral deposits, especially in the s. extremity, where the capital, La Paz, is situated. Harbors are numerous, and Magdalena Bay, lat. 24° 38′, is one of great excellence. Whale-fisheries and pearl-fisheries have been the most profitable industries, the latter of late years not so remunerative as formerly. Companies have from time to time been formed to develop more fully the resources of the territory, but its dryness and sterility have hitherto prevented much increase of population. The peninsula was entered by Jesuit missionaries 1697, and a permanent mission was established at Loreto, on the e. coast. Here and elsewhere the Jesuits maintained themselves, with some success, until their expulsion 1767. Their property passed first to the Franciscans, but soon the Dominicans acquired exclusive possession of the peninsula. Since 1822, Lower C. has shared the fortunes of the republic of Mexico. Pop. (by census, 1900, Oct. 28) 47,082.

CALIFORNIA, University of: principal institution of superior education in that state; an integral part of the public educational system. Its administration is in the hands of a body of regents including the gov. of the state, lieut.-gov., speaker of the assembly, state supt. of public instruction, the presidents of the State Agricultural Soc. and the Mechanics' Institute of San Francisco, the pres. of the univ., and 16 other regents appointed by the gov. and approved by the senate. The principal seat of the univ. is Berkeley. It includes, at that place, a college of letters, with four courses, and colleges of agriculture, mechanics, mining, civil engineering, and chemistry. It includes also, at San Francisco, the Hastings College of the Law, the Toland College of Medicine, the post-graduate medical department, the Mark Hopkins Institute of Art, the California College of Pharmacy, and the College of Dentistry.

The Lick Observatory, at Mt. Hamilton, is associated with the univ. as an astronomical department. The univ. was instituted 1868, and established at Berkeley 1873; it succeeded to the College of California, which had been in existence since 1855. Among the other prominent buildings of the univ. are the Hearst Memorial Mining Building, given by Mrs. Phoebe A. Hearst for the College of Mining of the univ. and as a memorial to the late Senator George Hearst; California Hall, for which an appropriation of $250,000 was made by the C. legislature; the Greek Theatre, an open-air auditorium, seating 8,000 people, presented by William Randolph Hearst; and the Library Building, the gift of Charles F. Doe of San Francisco, who bequeathed $700,000 for it. There are also museums, laboratories, and agricultural experiment grounds and stations. During regular sessions tuition in the colleges at Berkeley is free to residents of California; non-residents pay a fee of $10 each half year. In the professional colleges at San Francisco, except that of law, tuition fees are charged. In 1905–6 there were 486 officers, professors and instructors in all departments; 3,338 students in all courses, with the exception of 37 in the short course in agriculture, and 798 in the summer session; total, 4,173; and more than 150,000 volumes in the library.

CALIGRAPH: a kind of type-writer. See Calligraph.

CALIGULA, *ka-lĭg'ū-la*, Caius Cæsar Augustus Germanicus, Roman emperor (reigned A. D. 37–41): A. D. 12, Aug. 31—A. D. 41; b. Antium: youngest son of Germanicus (nephew of Tiberius) by Agrippina. He was educated in the camp, where the soldiers gave him the by-name C., from the half-boots (*caligæ*) which he wore. On the death of his brother Drusus, he was made augur in his stead; and on the death of Tiberius (A. D. 37), who, it was suspected, had

received foul-play at his hands, it was found that he had been appointed co-heir with the grandson of Tiberius; but the senate and the people allowed C. supreme and sole authority. In the beginning of his reign, he appeared hardly likely to fulfil the threat of Tiberius, who had talked of educating C. 'for the destruction of the Roman people.' He was, to appearance, lavishly generous and merciful, pardoning even those who had been the instruments of cruelty against his own family. But this ostentatious magnanimity was itself a disease, an unwholesome affectation, founded on no principle, or even humanity of heart, and coexisted with the most savage voluptuousness and lust. Consequently, when illness, the result of his vicious life, had weakened his faculties, the lower qualities of his nature obtained complete mastery. In addition to the senseless prodigality with which he commenced his career—expending in one year the enormous wealth left by Tiberius (720 millions of sesterces)—he began to manifest the most barbarous propensities. He banished or murdered his relatives, excepting his uncle Claudius and his sister Drusilla (with whom he carried on incestuous intercourse): filled Rome with executions, confiscating the estates of his victims; amused himself, while dining, by having victims tortured and slain in his presence; and uttered the wish 'that all the Roman people had but one neck, so that he might decapitate Rome at a blow!' To vie with Xerxes, he made a bridge of ships over the bay between Baiæ and Puteoli (a distance of three Roman miles and six hundred paces), and celebrated the exploit by a costly banquet on the middle of the bridge, and by collecting on it great numbers of people, and causing them to be drowned. His favorite horse was stabled in a palace, fed at a marble manger with gilded oats, was made a member of the college of priests, and afterward raised to the consulship. As a climax to all his absurdities, he declared himself a god, and had temples erected, and sacrifices offered to himself. To gratify his monstrous desires, he shrank from no infamy; he robbed, plundered, and taxed his subjects to a degree which seems almost incredible, and when even these means proved insufficient, he established a brothel in his own palace, and sent out his slaves to solicit public patronage for it. At length a conspiracy was formed against him, and the empire got riddance of him by an assassination.

CALIPASH, n. *kăl'ĭ-păsh* [F. *carapace;* Sp. *galapago*, fresh-water tortoise]: the part of a turtle belonging to the upper shell containing the so-called green fat. CAL'IPEE, n. *-ĭ-pē*, the part belonging to the under shell containing the yellow flesh. *Note.*—It has been suggested that these words are derived from, or are accommodations from, the Greek words *chalĕpos* and *chalĕpē*, rough, difficult—that is, indigestible.

CALIPERS, n. plu. *kăl'ĭ-pĕrz*, also spelled CALLIPERS [from CALIBRE, which see]: a kind of compasses with bowed shanks, for measuring the diameter of cylindrical, spherical, or other curved objects or work.

CALIPH, n. *kā'lĭf* or *kă-lēf'* [Ar. *khalif*, a successor· F. *calife:* Sp. *califa*]: the title assumed by the successors of Mahomet. CAL'IPHATE, *kăl'ĭf-āt*, or CAL'IPHAT, n. *-ăt*, the office or government of the caliph. Caliph is often spelled CALIF.

CALIPH, *kā'lĭf:* title of Mohammed's successors in temporal and spiritual power, from which the historians of the middle ages designated the Arab empire founded by these princes, the CALIPHATE. This empire, for two or three centuries, exceeded even the Roman empire in extent. As Mohammed died without leaving any sons, a contest arose concerning the inheritance of his power, which terminated (A.D. 632) in the triumph of Abubekr (q.v.), one of his fathers-in-law, over Ali, his nephew and son-in-law Abubekr now assumed the title of Califet-Resul-Allah—i. e. Representative or Deputy of the Prophet of God. He sent forth his armies for the extension of Mohammedanism, and after several victories over the forces of the Byzantine empire, conquered Syria. He was succeeded, 634, by Omar, another father-in-law of Mohammed, by whom Egypt and Jerusalem were annexed to the caliphate. He assumed the title of Emir-al-Mumenin—i. e., Prince of the Faithful—a title which all subsequent caliphs retained. Othman, son-in-law of the prophet, was the third C., and was elected by six persons appointed by Omar before his death. During his reign (644–656), the Arabian empire grew with extraordinary rapidity, being extended into Persia, and w. along the n. coast of Africa as far as Ceuta. The Byzantine emperors recovered Egypt; but it was wrested from them again at a prodigious expense of blood. The people of Medina elected Ali-ben-Abi-Taleb as C. upon the death of Othman. The Shiites regard him as the first true Imam or high priest, and honor him and his son Hassan almost equally with Mohammed himself. Contests against rivals prevented him from doing much for the extension of the caliphate. Moawijah, gov. of Damascus, having made himself really independent during Ali's life, and having extended his power over Syria, Egypt, and part of Arabia, became C. in 661, and founded the dynasty of the Ommiades, making the caliphate hereditary. He removed the seat of the caliphate to Damascus. His armies ravaged Asia Minor, and laid siege to Constantinople, but could not take it. He made important conquests, however, in central Asia. The caliphate did not remain long in the family of Moawijah, and frequently in one or other of the subject countries a governor raised himself to a temporary independence; and rival caliphs often contended for power. Abdalmelek (685–705) united all the Moslems under his dominion. Under his son, Walid I., the caliphate reached its zenith of prosperity, the Arabs conquering Turkestan, 707, Galatia 710, and Spain, 711. Under Hesham, the progress of the Arabs in the west was arrested by Charles Martel at Tours (732) and at Narbonne (736). The dynasty of the Ommiades in Asia terminated with Merwan II., 752, giving place to that of the Abbasides. But a branch of the Ommiades founded an independent caliphate at Cordova, and another

founded one in Arabia, which subsisted till the 16th c. Abul-Abbas (750–754), the first Abbaside Caliph signalized himself by his cruelty and the torrents of human blood which he shed. His successor, Abu-Jafar, called Al-Mansur, a patron of the arts, but a persecutor of Christians, founded Bagdad (q.v.), and removed the seat of the caliphate thither. From the beginning of the 9th c., the Arab empire, which had suffered much from corruption and internal disorganization under the last caliphs of the Ommiade dynasty, and had never completely recovered, showed increasing signs of decay. Even under the Caliph Harum-al-Raschid, whose praises the eastern poets were accustomed to celebrate, independent kingdoms were established (800) by the Aghlabides in Tunis, and the Edrisides in Fez. In 821, Taher, gov. of Khorassan, made himself independent, and established a dynasty there, and other governors of provinces followed his example. But under the Caliph Al-Mamum, the Arabians conquered Sicily and Sardinia, the former of which they held till it was taken from them 1035 by the Normans; and the latter, till it was conquered by the Pisans, 1051. The Caliph Motassem (833–842) was the first to employ Turkish soldiers; but the practice was followed by his successors; and the Turkish bodyguard soon became a formidable power in the caliphate, and about the middle of the 9th c. assumed the right of deciding the succession to the throne. Many of the caliphs, meanwhile, were base voluptuaries, and of the others, some were of little capacity, and their power rapidly declined. Ere the middle of the 10th c., the caliphs themselves exercised a mere nominal sovereignty, while the emirs, like the mayors of the palace toward the close of the Merovingian dynasty among the Franks, exercised all real power. The princes of the Fatimide dynasty, which succeeded that of the Aghlabides in Tunis, having made themselves masters of Egypt, 970, assumed the title of Caliph, so that there were now three caliphates—at Bagdad, at Cairo, and at Cordova. In the 11th c., the caliphs of Bagdad were still acknowledged as the spiritual chiefs of all the Moslems; but their temporal power scarcely extended beyond the walls of Bagdad. Bagdad itself became the prey of a Mongol horde, 1258, and the representative of the caliphs fled to Egypt, where, under the protection of the Mamelukes, who had made themselves masters of that country, 1250, he retained his title and spiritual power, which he transmitted to his successors, who continued to reside there till the Turks conquered Egypt, 1517, when the last of them was carried to Constantinople; and since that time the Turkish sultans have assumed the title of Caliph.

CALIP'PIC CY'CLE: named from Calippus, or Callippus, astronomer of Greece, B.C. 4th c.: see PERIOD.

CALISAYA, n. *kăl-is-ā'yă*: the same as CINCHONA.

CALISTHENICS, or CALLISTHENICS, n. plu. *kăl'ĭs-thĕn'ĭks* [Gr. *kalos*, beautiful; *sthenos*, strength]: the art of promoting the health and proper development of the body by exercise; the exercising employed for this purpose. CAL'ISTHEN'IC, a. pertaining to.

CALITRI, *kâ-lē'trē:* town of Italy, province of Avellino, near the Ofanto, 7 m. e.n.e. of Conza. Agriculture is a chief pursuit. Sheep are reared in the vicinity. Pop. 6,200.

CALIVER, n. *kăl'ĭ-vēr* [old Dut. *koluvre*, a kind of cannon: Sp. *calibre*, a bore, a diameter: comp. L. *colŭber*, an adder (see CALIBRE)]: in *OE.*, a matchlock or fire-arm about midway in size and character between an arquebus and a musket; it was small enough to be fired without a rest or support.

CALIXTINES, *ka-lĭks'tīnz* or *ka-lĭks'tĭnz:* Bohemian religious sect, named from the Latin *calix*, a cup, because they contended for giving the cup, as well as the consecrated wafer, to the laity. Their confession of faith (1421) contained the following articles: 1. That the word of God ought be freely and regularly preached by the priests of the Lord throughout Bohemia; 2. That the eucharist in both kinds ought to be administered to all burdened with 'no mortal sins,' according to the language and command of the Saviour; 3. That the clergy should separate themselves from secular affairs; 4. That all 'mortal sins' and especially public ones, such as debauchery and simony, and any other disorders contrary to the law of God, should be prevented or punished by those who were the lawful authorities in such matters. In other main points they were moderate followers of John Huss, and were opposed to the more extreme sect of Taborites (q.v.). Their peculiar articles of faith were conceded by order of the council at Basel (1433); and having prevailed over the Taborites in the conflict which took place at Boehmischbrod, 1434, May 30, they became the dominant party in Bohemia, and exercised considerable influence over political affairs. Gradually, however, the Calixtines lapsed from the severity of their four articles, while the schism of the energetic Taborites, and later of the Bohemian Brethren (q.v.), rendered them powerless, so that at the beginning of the 16th c., they served only to prepare the way for Protestantism.

CALIXTUS, *kâ-lĭks'tŭs*, GEORG (properly, *Callisen*): Lutheran theologian; 1586, Dec. 14—1656, Mar. 19; b. Medelbye in Schleswig; studied at Flensborg, and Helmstedt; and 1605, became prof. of philosophy in Helmstedt. Two years later he betook himself to theology, and attracted great attention by the breadth and originality of his views. After travelling in Germany, Holland, England, and France, where he made the acquaintance of the most learned men of his time, he

returned to Helmstedt 1613, and was appointed prof. of theology. His genius, the depth of his knowledge, and his large experience of the world and of men, acquired in his travels, developed in him a spirit of tolerance toward all who held their religious opinons honestly. Although his dissertations on the Holy Scripture, transubstantiation, communion in one kind, etc., are acknowledged by learned Roman Catholics to be about the most solid and admirable which have been composed by Protestants against the distinctive doctrines of Catholicism, he was, on account of some statements in his work, entitled *De Præcipuis Religionis Christianæ Capitibus* (Helmstedt, 1613), which seemed favorable to Rom. Cath. dogmas, and of others in his *Epitome Theologiæ Moralis* (Helmstedt, 1634), *De Tolerantia Reformatorum*, etc. (Helmstedt, 1658), which approached too near the Reformed or Calvinistic standpoint, declared guilty of abominable heresy by the adherents of the letter of the concordienformel—i. e., the orthodox and dogmatically rigid Lutherans. Calixtus felt keenly that the polemical harshness of Lutheranism was a serious obstacle in the way of a great Catholic Christianity, and that Protestantism must assume another form before it could hope to become the religion of Europe. Under this conviction, Calixtus endeavored to show that the oldest and most fundamental articles of the Christian faith—viz., the facts embodied in the 'Apostles' Creed'—were common to all Christian sects. In subsequent dissertations, having stated that the doctrine of the Trinity was less distinctly taught in the Old than in the New Testament, and that good works were necessary to salvation; and finally at the religious conference of Thorn, 1649, whither he was sent as a mediator by the Elector of Brandenburg, having been on more intimate terms with the Calvinistic than the Lutheran theologians, Calixtus was accused of apostasy. Fortunately, however, he had powerful friends, who stood firmly by him, and through their help he was enabled to retain his professional chair till his death.

CALK, v. *kawk* [OF. *cauquer*, to tread, to place a small roll of lint in a wound: L. *calcārĕ*, to press or stuff: Gael. *calc*, to ram, to drive]: to close the seams between a ship's planking with oakum to prevent them admitting water; to point or rough the shoe of a horse to prevent its slipping on ice. CALK'ING, imp. CALKED, pp. *kawkt*. CALK'ER, n. one who. CALKINS, n. plu. *kaw'kĭns*, the prominent parts of a horse's shoes sharpened to prevent its slipping on the ice. CALKING, the process of copying or transferring a drawing by covering the back side of a design with black lead, or red chalk, and tracing lines through on a waxed plate, or wall, or other matter, by passing lightly over each stroke of the design with a point, which leaves an impression of the color on the plate, paper, or wall.

CALKINS, *kaw-kĭns*, Franklin Welles: American writer; b. Iowa co., Wisconsin, 1855, June 5. He has traveled extensively in the Rocky Mountains, 1870–86; and is the author of *Frontier Sketches* (1893); *Indian Tales* (1893); *Hunting Stories* (1893); *The Cougar Tamer* (1899); *My Host the Enemy* (1901); *Two Wilderness Voyagers* (1902); *Sioux Legends; Tokala Noni.*

CALKINS, Gary Nathan: American scientist: b. Valparaiso, Ind., 1869, Jan. 18. He was graduated at the Massachusetts Institute of Technology in 1890; had charge of scientific expeditions to Alaska in 1896 and 1897; and in 1900 was instructor in Zoology at Columbia University.

CALL, v. *kawl* [Icel. *kalla;* Dan. *kalde*, to call, to chatter]: to name; to appoint or designate: to utter a loud sound in order to attract attention: to invite to come; to summon; to warn; to exhort; to visit: N. a summons or invitation; a command; a short visit; a military signal on the trumpet, the demand for a stipulated portion of the payment for a share in a joint-stock operation; there are usually four *calls* at intervals of not less than three months; a divine summons; divine inspiration; in *OE.*, vocation; employment. Cal'ling, imp.: N. business; employment. Called, pp. *kawld.* Call'er, one who; a visitor. Call-bird, a decoy bird. Call-boy, a boy whose duty it is to call actors when their turn comes to appear on the stage. To call down, to invite or bring down. To call back, to bring again; to revoke. To call for, to claim or require. To call in, to withdraw from circulation; to collect. To call forth, to bring out. To call names, to stigmatize with opprobrious epithets. To call off, to bring away; to divert. To call out, to summon; to speak aloud; to summon to service; to challenge to fight. To call up, to bring before; to bring to recollection. To call upon, to visit; to invite; to appeal to. To call over, to read aloud the several items or particulars of anything. To call on, to pay a visit to; to pray to or worship. To call at, to visit a place. To call to mind, to recollect; to remember. To call to account, to demand explanations from in order to clear up and explain. Effectual calling, in *theol.*, an invitation to believe in Christ which has received the confirmation of the Holy Spirit. Call to the ministry, an invitation to become the pastor of a church from the members. Call to the bar, formal announcement of the permission of a law student to become a barrister in England and Ireland (see Barrister: Inns of Court: Advocates, Faculty of). Call of the house, in *parliament*, a special order by the speaker for each member to attend in his place.—Syn. of 'call, v.': to bid; invite; summon; cite; name; denominate; convoke; assemble; collect; exhort;

warn; proclaim; invoke; designate;—of 'calling': business; occupation; employment; vocation; trade; office; profession; engagement.

CALL, in theological and ecclesiastical relations: a term with various applications.—1. The command or invitation to believe in Jesus Christ is designated the *call of God*, or the *gospel call*. Calvinistic theologians make a distinction between a *general* call and a *special* or *effectual* call. The former is addressed, they say, to all whom the word of God comes; but it is insufficient of itself to induce any man to the act of faith, and requires, in order to its efficacy, that it be accompanied by the special and irresistible grace of the Holy Spirit. They are careful, however, to state that the general or outward calling by the word always precedes and accompanies the special and effectual calling by the Spirit. The notion of an inward call by the Spirit of God in the soul, unconnected with outward calling by the word, belongs not to Calvinistic, but to mystic theology. 2. A call to office in the church, and particularly to the ministry of the gospel, is regarded by Christians generally as proceeding from God; and the church of England requires of candidates for ordination an express profession of their trust that they are so moved of the Holy Spirit. 3. A call by the people who are to be under the pastoral care of a minister has been regarded in large denominations of Protestant churches as necessary to the establishment of the pastoral relation; and in denominations where it is not a formal requisite, it is often held to be practically secured through the representative action of proper officials. But among those with whom it is a requisite, there have been great differences of opinion as to what constitutes a sufficient call, and great differences of practice with regard to it. Some of the principal dissensions in Scotch Presbyterianism have had their origin in this question. The election of a pastor by the *Christian people* of his *parish* or *congregation*, has been contended for by many as the true call, or the best kind of it; others, approving of patronage with certain limitations, have contended no less earnestly for the right of the people to be consulted, so that without their concurring by a call, the patron's presentee should not be held entitled to be inducted into the pastoral office; and according to the practice of the Church of Scotland, this concurrence was always at least formally sought. Questions concerning the call and its proper value, supposed to have been determined by the Earl of Aberdeen's Act, passed at the *disruption* of the Church of Scotland, 1843, were not finally settled until the passing of the Act for the Abolition of Patronage (1874), which gives the right of calling to the congregation. See SCOTLAND, CHURCH OF: FREE CHURCH OF SCOTLAND: PATRONAGE.

CALL, Boatswain's: metal whistle (also its sound) used by the boatswain and his mate on shipboard. Various strains or kinds of sound produced denote signals or orders for hoisting, heaving, lowering, veering, belaying, letting-go, etc.

CALLANT, n. *kăl'ănt* [Gael. *gille*, a youth; *galan*, a youth, a sapling]: in *Scot.*, a youth: see Gallant.

CALLAO, *kâl-lâ'ō* or *kâl-yâ'ō:* the port of Lima, cap. of Peru, connected with that city by a railway of 6 m.; lat. 12° s., long. 77° 13′ w. Fine harbor-works, with extensive pier and dock accommodations, were completed 1875. The roadstead is large, free from rocks, and safe, sheltered by the island of San Lorenzo. The exports are guano, specie, copper, cotton, bark, and hides. The present Callao dates only from 1746, when the original city was destroyed by an earthquake. Callao was bombarded 1880, during the war between Chili and Peru. Pop. abt. 20,000.

CALLAWAY, Morgan: American educator; b. Cuthbert, Ga., 1862, Nov. 3. He was educated at Emory College, Ga., and at Johns Hopkins University, and has been professor of English in the University of Texas from 1890. He has published *The Absolute Participle in Anglo-Saxon* (1889); *The Appositive Participle in Anglo-Saxon* (1901); etc.

CALLAWAY, Samuel Roger: American railroad president; b. Toronto, Canada, 1850, Dec. 24; d. New York, 1904, June 1. At the age of 14 he entered the employ of the Grand T. Ry., and later was in the service of the Canadian Express Company, and Great W. Ry. His rapid progress thereafter may be summarized as follows: in 1875 he became superintendent of the Detroit & M. R.R.; in 1880, manager of the Chicago & G. T.; in 1884, vice-president of the Union P. and allied lines of nearly 6,000 miles; president of the Toledo, St. L. & K. C. R.R., 1887–95; president of the Lake Shore & M. S., 1897–8; president of the New York C. & H. R. R.R., 1898–1901. He was regarded as one of the ablest railway managers in the United States. From 1901 he was president of the American Locomotive Company.

CALLCOTT, *kawl'kŭt*, Sir Augustus Wall, r.a.: 1779–1844, Nov.; b. Kensington, London: landscape painter. In 1803, he began to apply himself to landscape painting; in 1810, was made a member of the Royal Acad.; was knighted 1837, and in 1844, made conservator of royal pictures. His landscapes are remarkable for beauty, clear definition of objects, good drawing, and truthful natural coloring.

CALL'COTT, John Wall: musical composer: 1766–1821, May; b. Kensington, London; elder brother of Sir Augustus Wall Callcott. Too nervous to be a surgeon, for which he was intended, he devoted his atten-

tion to music, and in 1785 won three of the four gold medals annually given by the Catch Club; the admired *O Sovereign of the willing Soul* being one of the successful pieces. During the next ten years he obtained 20 of the medals given by the same society. In 1785, he was made bachelor, and, five years afterward, doctor of music, at Oxford. In 1805, he published his *Musical Grammar;* in the following year his mind gave way under the continuous strain to which it had been subject. He recovered again, but only for three years, when he relapsed, and continued insane until his death. He was one of the most eminent composers belonging to the British school of music, and especially celebrated for his glee compositions. His choicest productions were published in two vols. by his son-in-law, Mr. Horsley, 1824.

CALLER, a *kăl'lĕr* [Icel. *kalr*, fresh: Gael. *cail*, disposition, temper]: in *Scot.*, fresh; pure; in a natural state; having a rosy, healthy appearance.

CALLERNISH, *kăl'lĕr-nĭsh:* district on the w. coast of the island of Lewis, about 16 m. from Stornoway, remarkable for its circles of Standing Stones (q.v.). There are four circles, at no great distance from one another, but without any visible relation. The principal one is of unusually elaborate design. 'A double line of upright stones run parallel to each other in a northerly direction, while a single line of similar stones is projected from the south, east, and west points, thus giving a cruciform figure to the structure. A stone of larger dimensions than any of the others occupies the centre of the circle, and completes the whole. . . . That the position was chosen and laid down from astronomical observation, can easily be demonstrated by visiting the spot on a clear night, when it will be found that by bringing the upper part of the single line of stones extending to the s. to bear upon the top of the large stone in the centre of the circle, the apex of that stone coincides exactly with the pole-star. . . . The stones themselves are not columnar, or shaped into any form; they are simply broad, flat blocks of gneiss—the prevailing rock from the Butt of the Lewis to Barra Head. The following are their dimensions: diameter of circle, about 40 ft.; length of west line, 43 ft.; length of east line, 38 ft.; length of south line, 69 ft.; length of avenue, 270 ft.; breadth of avenue, 27 ft.; average height of stones, 6 to 8 ft.; height of centre stone, 12 ft. There are 13 stones in the circle, including the centre one, 19 in the avenue, 5 in each of the e. and w., and 6 in the s. arm. The measurements of height are taken from the present level; but there is a bed of peat-moss, 4 or 5 ft. thick, through which the stones rise from the clay beneath; this gives a height of 16 to 17 ft. to the centre stone,

and from 10 to 13 ft. to the others, exclusive of the foundation.

CALLET, n. a. *kăl'lĕt* [F. *caillete*, gossip, a tattler: Gael. *caile*, a vulgar girl]: a woman who is a drab, trull, or scold; a vulgar, violent, and unchaste woman.

CALLICHTHYS, *kăl-lĭk'thĭs* [Gr. *kalos*, beautiful; *ichthys*, a fish]: genus of fishes of the family *Siluridæ* (q.v.), having the body almost entirely covered by four rows of large, hard, narrow, scaly plates, two rows on each side. The head is also protected by a sort of helmet. The mouth is small, the teeth very small; two long barbules hang from each angle of the mouth. The specis of this genus are natives of warm climates, particularly of S. America. They are interesting because, when the streams or pools which they inhabit dry up, they make their way across the land to some other piece of water, even although at a considerable distance. They also sometimes bury themselves in the mud of wet meadows out of which they are digged. They have no special organs for carrying a supply of water with them, like the climbing perch, but are supposed to retain a little between the plates of their bodies. A still more interesting part of the natural history of these fishes is their making regular nests, generally of leaves, in which they deposit their eggs, near the margin of the water, at the beginning of the rainy season, the male and female uniting in watching them until they are hatched. These habits are shared by the species of the allied genus *Doras*, in which the lateral plates are broader, keeled, and each ending in a spine.

CALLIÉRES BONNEVUE, *kâ-le-ăr' bon-vü*, Louis Hector, Chevalier de: 1639–1703. He was gov. of Montreal 1684; led the advance of the troops which attacked the Six Nations in N. Y. 1687; went to France to urge that New York city be seized as security against British interference with French dominion in the north; and was made gov. gen. of Canada, 1699.

CALLIGONUM, *kăl-lĭg'on-ŭm:* a genus of plants of the nat. ord. *Polygoneæ* (q.v.), having a quadrangular fruit (*achene*, q.v.) winged at the angles. The best known species is *C. Pallasia*, a succulent shrub found on the sandy steppes near the Caspian Sea, and in the lower part of the basin of the Volga, where its acid fruit, and its also acid shoots often serve to allay the thirst of the Kalmucks and of weary travellers. Its root strikes deep into the sand, is swollen at its upper part, and, when cut there, gives out a nutritious gum resembling tragacanth (q.v.), which is also obtained by pounding and boiling it, and on which the Kalmucks feed in times of scarcity.

CALLIGRAPHY, or Caligraphy, n. *kă-lĭg'ră-fĭ* [Gr. *kalos*, beautiful, fair; *grapho*, I write]: elegant or beautiful writing. Callig'raphist, n. *-ră-fĭst*, one who

writes beautifully. CALLIGRAPHIC, a. *kăl'ĭ-grăf'ĭk*, pertaining to.

CALLIMACHUS, *kăl-lĭm'a-kŭs:* eminent poet, grammarian, and critic of the Alexandrian period, about the middle of B.C. 3d c. He was of a distinguished family at Cyrene, in Libya; taught grammar and belles-lettres in Alexandria; was a favorite of Ptolemy Philadelphus, and of his successor, Ptolemy Euergetes; and was made principal librarian of the Alexandrian Library. He wrote many works on the most various subjects (Suidas mentions 800, but only fragments are extant; of his poems the few that remain bear the marks of an age when the artificial had obtained preference over the natural.

CALLINGER, *kăl'lĭn-jĕr:* one of the hill-forts of Bundelcund (q.v.), about 700 ft. above the adjacent plain, and separated from a neighboring range of mountains by a ravine 1,200 yards in width. It is in lat. 25° n., and long. 80° 32′ e.; 112 m. s.w. of Allahabad. From its position and size, Callinger must formerly have been a place of great strength. It was stormed by the British, 1812. At the s.e. base of the rock stands a town of the same name, which, though now much decayed, yet bears signs of ancient extent and grandeur.

CALLING THE DIET: in Scotch law, the equivalent of *Arraignment* (q.v.); also see INDICTMENT: VERDICT: DEFENSE.

CALLIOPE, n. *kăl-lī'ō-pē* [Gr. and L. the *sweet-voiced*]: in *anc. myth.*, the chief of the nine Muses, the mother of Orpheus,—she presides over eloquence and heroic poetry, said to be the mother of Orpheus, of the Sirens, etc. Calliope was represented usually with a style and wax tablets. [U. S.] a steam-organ; a species of humming-bird, *Trochilus Calliope.*

CALLIPERS, n. plu.: see CALIPERS.

CALLIRHOE, *kăl-lĭr'hō-ē:* 'the fountain of nine springs,' near Anthens, whose waters flowed through nine channels.

CAL'LISEN, HENRY: Danish physician and surgeon; b. Pentz, Holstein, 1740; d. Copenhagen, 1824, Feb. 5. He educated himself by his own exertions, and was made, in 1771, chief surgeon of the Danish fleet, and in 1773 professor of surgery at the University of Copenhagen. He wrote in 1777 his *Institut. Chirurgiæ Hodiernæ*, which was received with applause by all Europe.

CALLISTHENES, *kăl-lĭs'the-nēz*, of Olynthus: B.C. 360–328, son of Hero, a cousin of Aristotle. He was educated by Aristotle, together with Alexander the Great. He applied himself to natural and political history, and accompanied Alexander in his expedition to India. He incurred the displeasure of the courtiers and roal favorites, and of Alexander himself, who was dis-

pleased by Callisthenes' remonstrating against Alexander's intended assumption of divine honors, and in general by his bold, indiscreet, outspeaking ways; and he was put to death on a pretended charge of treason. Only a few fragments of his historic works remain, and these are not valuable. The *History of Alexander* ascribed to him, of which there are several MSS. in the Paris Library, is evidently a production of the 7th c., and rather a romance than a history:.

CALLISTRATUS, *kăl-lĭs'tra-tŭs:* Athenian orator, son of Callicrates of Aphidna. One of his speeches, exciting the emulation of Demosthenes, is said to have been the cause of the latter applying himself to oratory. Callistratus had brilliant talents as a statesman, and exercised a dominant influence during the Theban supremacy, as an opponent of Thebes. In B.C. 361, however, he was condemned to death by the Athenians, and went into banishment; returning, he was put to death. Datum, on the Strymonic gulf, is said to have been founded by him during his exile.

CAL'LITHRIX: see SAGOUIN.

CAL'LITRIS: see SANDARACH.

CALLOS'ITIES, see CORNS.

CALLOT, *kâ-lō'*, JACQUES: 1592–1635; b. Nancy: French artist. Proceeding to Rome he commenced drawing and engraving under Thomassin in his 18th year. He next went to Florence, where, by numerous spirited etchings, he gained great fame, and engraved for Cosmo II., Grand Duke of Tuscany, a series of plates of court-festivals, etc. When his patron died (1621), Callot returned to his native place, and increased his reputation by a copious series of etchings, including six plates of the siege of Breda. By order of Louis XIII., who invited Callot to Paris, etchings of the sieges of Rochelle and the Ile Rhé were executed; but Callot refused to commemorate by art the capture of his native town, and, declining the pension offered by the king, returned to Nancy, where he died. His activity as an artist was marvellous. Of his engravings, 1,800 are still preserved at Dresden, and are invaluable helps to a vivid conception of the manners, conditions of life, events, etc., in the 17th c. Callot's *Misères de la Guerre,* series of 18 plates, are especially celebrated.

CAL'LUS, in Surgery: term in old surgical works, and still used popularly, to indicate the exuded material by which fractures of bones are consolidated together. If the broken ends are accurately adjusted to each other, there is no projection of callus, but merely a slight deposition of it between the two surfaces; if, however, the adjustment is not accurate, the callus is effused in such quantity as to fill up any interspaces that may exist, and as often to form a considerable hard swelling round the seat of the fracture; any excess is, however, usually absorbed during the last stage of the repair of a fracture. When the broken ends are allowed to move upon each other—which, of course, should always be prevented, if possible—a ferrule of new bone, encircling both fragments for some little distance, so as to splice them together, till they are united by a permanent callus, is formed; this is termed a *provisional* callus.

CALM, a. *kâm* [F. *calme*—from It., Sp. *calma*, absence of wind, quiet: Gael. *calm*, and *calma*, brave, cool, resolute]: not subjected to disturbance or excitement; still; quiet; tranquil; undisturbed: N. stillness; quiet; repose; freedom from agitation or motion: V. to still; to quiet; to free from agitation; to pacify; to tranquilize. CALM'ING, imp. CALMED, pp. *kâmd*. CALM'ER, n. one who calms. CALM'LY, ad. *-lĭ*, in a quiet, undisturbed manner; serenely; without excitement. CALMNESS, n. the state or quality of being in quietness; serenity. CALMY, a. *kâm'ĭ*, in *OE.*, still; quiet. DEAD CALM, a calm without a movement in air or a ruffle on sea; a perfect stillness.—SYN. of 'calm, a.': still; quiet; serene; tranquil; peaceful; placid; settled; composed; collected; undisturbed; unruffled; sedate;—of 'calm, v.', to lull; appease; still; quiet; assuage; tranquilize.

CALMAR: see KALMAR.

CALMET, *kâl-mā'*, AUGUSTINE: exegetical and historical writer, and learned Benedictine: 1672, Feb. 26—1757, Oct. 25; b. Mesnil-la-Horgue, near Commercy, France. In 1689 he entered the order of Benedictines. In 1698 he was appointed teacher of philosophy and theology in the Abbey Moyen-Moutier; in 1704 sub-prior of a convent of learned monks at Münster, Alsace; and 1706 he went to

Paris, to superintend the publication of his *Commentary on the Bible.* He was afterward appointed prior at Lay (1715), Abbot of St. Leopold (1718), Abbot of Senones in Lorraine (1728); and died at Paris. His exegetical writings have been studied with advantage by both Roman Catholics and Protestants. The *Commentary on the Bible* (23 vols., Paris, 1707–16) though marked by the author's deficient knowledge of the oriental languages, contains valuable researches in biblical antiquities. Calmet's *Historical and Critical Dictionary of the Bible* (4 vols., Paris, 1722–28) was translated into English, German, and other languages, and has passed through many editions. His other works —a *History of the Bible,* and of the *Jews* (1718), and a *Universal History* (1735)— are mere compilations; but his *History of Lorraine* is founded on original researches. His learning in some departments was great; but solid criticism and vigorous intellect are wanting in all his works.

CALMS, or CALM LAT'ITUDES: those parts of the ocean, near the equator, which are subject to total absence of wind for long periods. The part of the ocean where calms are most looked for, is between the region of the trade-winds and that of the variable winds: see WINDS. It is almost as much dreaded by seamen as a region of storms, for the ship is unnavigable; and during a calm of many weeks, food and water may be nearly exhausted, at a point too far from land for boats to reach it. Where a calm occurs unexpectedly, it is likely to be followed by violent storms.

CALMUC, or CALMUCK, or KALMUC, a. n. *kăl'mŭk:* applied to a tribe of Mongols in Tartary, and near the Volga, Russia. See KALMUCKS.

CALNE, *kân:* an old-fashioned market-town of Wiltshire, England, on the river Marden, 31 m. n.n.w. of Salisbury. It lies in one of the many valleys in the chalk escarpment of this part of England, with the plateau of the Marlborough Downs and Salisbury Plain on the e. and s. In 1863, a branch line was opened to Calne, six m. from the Chippenham station of the Great Western railway. The principal industry is the curing of bacon. The manufacture of woolens, formerly important, is now almost extinct. It has a grammar school (1660) and town hall (1882). Roman remains have been found here. The West-Saxon kings had a palace at Calne, but no tracs of it remain. At a synod held here by St. Dunstan 977, relative to the celibacy of the clergy, the floor of the room in which the synod sat gave way, precipitating all to the ground but St. Dunstan, who presided. On an almost perpendicular declivity 3 m. e. of Calne is the figure of a *horse,* 157 ft. long, in a spirited attitude. It was cut out in white chalky ground about 1700 by Dr. Allsopp, and is visible 50 m. away. Calne ceased to be a parliamentary borough 1885. Pop. 3,495.

CALO'EE: see BOEHMERIA.

CALOMARDE, *ka-lo-mâr'da,* DON FRANCISCO TADEO, Count: 1775–1842; b. Villel, in Aragon. He studied at

Saragossa, where he passed as advocate. After the expulsion of the French, and the return of Ferdinand VII. 1814, Calomarde was among the first to hurry to Aragon, and do homage to him as an absolute monarch. As a reward of his obsequious celerity, he obtained the highest office in the *Secretaria General de Indias*, but lost it on account of accepting a bribe. On the restoration of the constitution 1820, he unsuccessfully courted the favor of the liberals; but when the French army in 1823 enabled the king once more to rule despotically, Calomarde was appointed sec. of the *Cámara del Real Patronato*, one of the most influential offices in the kingdom. Not long afterward, the king made him minister of justice. While he held this function, he persecuted the liberals with cold-blooded savageness, recalled the Jesuits, reopened the monasteries, and closed the universities. He also secretly favored the party of Don Carlos; but, on the other hand, by treating any unseasonable outbreak with a strictness bordering on cruelty, he preserved himself from the suspicion of being implicated in their schemes. In 1833, when Ferdinand was supposed to be on his death-bed, he was prevailed on by Calomarde to reintroduce the Salic Law, by which Christina was excluded from the throne, and Don Carlos, the favorite of the absolutists, appointed his successor. This excited the hatred of the nation; Ferdinand recovering, abolished the law, and to avoid imprisonment, Calomarde fled to France, and died at Toulouse.

CALOMEL, n. *kăl'ō-mĕl* [Gr. *kalos*, beautiful; *melas*, black—*lit.*, a beautiful product from a black substance]: popular name of one of the compounds of mercury (Hg) and chlorine (Cl), used in medicine; known to chemists as the subchloride of mercury (HgCl). It is prepared by taking two equal portions of mercury, dissolving one portion in hot concentrated sulphuric acid (SO_3), which forms sulphate of mercury ($HgOSO_3$), thereafter adding the second part of the metal, and triturating the whole in a mortar till the metal becomes incorporated with the sulphate of mercury. This mixture is then added to one-half its weight of common salt (NaCl), and heated in a retort, when calomel sublimes, and condenses in the cool part of the receiver, as a fine white powder. A minute portion of corrosive sublimate which accompanies it, is removed by washing with water. Calomel is very dense. It is not soluble in water, and sparingly so in acids. It turns black on the addition of lime-water, potash, soda, or ammonia; and when heated in an iron spoon, or on a knife, it does not char, but rises in vapor, sublimes unaltered, and readily condenses again on any cool surface held near it. Although calomel has been used probably more than any other preparation of mercury, it is not known to have been employed before the 17th c. For its medicinal virtues, see MERCURY.

CALONNE, *kâ-lŏn'*, CHARLES ALEXANDRE DE, Controller General of Finance in France under Louis XVI.: 1734, Jan. 20—1802, Oct. 30; b. Douay. Possessing superior

abilities, he studied law, and having filled successively various offices, was made, 1783, controller-gen. of the treasury. In this capacity he soon gained favor among the courtiers, who had complained of the parsimony of Turgot and Necker. Calonne, though he found French finances in a deplorable state, was determined not to *seem* poor, gave brilliant entertainments, paid off the debts of his patron, the Count of Artois, supplied the queen with sufficient pocket-money, granted pensions and gratuities to his supporters and favorites, paid off arrears, and purchased the residences of St. Cloud and Rambouillet. His means of raising money were perfectly simple—he borrowed, anticipated, issued chancery-edicts, and prolonged and augmented extraordinary taxations in a style never known before. The parliament resisted these measures, but Calonne, backed by royal authority, carried them into execution. The crisis necessarily arrived; and in 1786, when the people could bear the extraordinary taxation no longer, Calonne advised the king to convoke the assembly of the notables, and proposed to abolish the privileges (exemption from taxes) of the noble and wealthy, to take the duty off salt, to abolish *socage* (feudal or compulsory service to the lord of the manor), and to distribute the burden of taxation more equally. The people and the aristocracy demanded a convocation of the states general, instead of the assembly of the notables; but Calonne boldly proceeded with his plan, opened the assembly of the notables, 1787, Feb. 2, and in a pleasant and florid oration, described the general prosperity of French industry and commerce, and brought his speech to a climax by confessing that the annual deficit of the treasury had risen to 115 millions of francs, and that from 1776 to 1786, the government had borrowed no less a sum than about 1,250 millions! The notables, instead of proceeding with Calonne's plan of reorganization, demanded from him a statement of accounts. Not being able to give this satisfactorily, he was stripped of his dignities, and banished to Lorraine. After this, Calonne resided chiefly in England, until in 1802 he obtained from Bonaparte permission to return to France, where he died, in very embarrassed circumstances.

CALOPHYLLUM, *kăl-o'fĭl'ŭm* [Gr., beautiful leaf]: genus of trees of the nat. ord. *Guttiferæ* (q.v.), natives of warm climates. Some of the species yield valuable timber, as *C. angustifolium*, the Piney Tree, which grows at Penang, and in the islands eastward of the Bay of Bengal, and furnishes the beautiful straight spars called *Peon* The resinous products of some species are valuable, and among them are some of the substances known by the name of Tacamahaca (q.v.). *C. Inophyllum*, which yields true East Indian Tacamahaca, is a very large and beautiful umbrageous tree, often planted for its shade and the fragrance of its flowers, which are white and in loose axillary racemes. It is one of the most valuable timber-trees of the South Sea Islands. The timber resembles mahogany, being of equally close texture, though of lighter color, and very durable. The leaves are oblong and obtuse; the fruit

—which in all this genus is a globose drupe or stone fruit —is about the size of a walnut; and a fixed oil is expressed from its kernel, which is used for lamps, etc.

CALORIC, n. *kă-lŏr′ĭk* [L. *calor*, heat: F. *calorique:* It. *calore*]: the cause or matter which was supposed to produce heat; used also for 'heat,' but improperly (see HEAT). CAL′ORIF′IC, a. *-ĭf ĭk* [L. *facĭō*, I make]: causing heat. CALORES′CENCE, n., conversion of obscure heat-rays into luminous heat-rays. CALOR′IFICA′TION, n. *-ĭ-kā′shŭn.* CALORIDUCT, *ka-lŏr′ĭ-dŭkt*, [L. *ducts*, a leading]: a pipe or passage for conducting heat. CALORIFERE, n. *kă-lŏr′ĭ-fēr* [F.—from L. *calor*, heat; *ferrĕ*, to bring]: an apparatus for conveying and distributing heat, particularly in conservatories. CAL′ORIM′ETER, n. *-ĭm′ĕ-tėr*, heat; Gr. *metron*, a measure]: an apparatus for measuring the heat contained in bodies (see HEAT). CALORIMO′TOR, *-mō′tėr*, a galvanic instrument for evolving heat.

CALORIC ENGINE: name given by Capt. Ericsson to his latest *air-engine.* Though there seems no reason for this change of name, except perhaps for distinction of this engine from previous unsuccessful air-engines, yet as the name is in use, air-engine and caloric engine may be here treated as synonymous terms.

It is a well-known law, applicable to all thermo-dynamic engines, that (presupposing the merely mechanical part of the machine to be perfect) the heat converted into work bears the same proportion to the total heat given to the fluid that the range of temperature bears to the highest *absolute* temperature of the fluid. Thus supposing an engine to receive steam* at the temperature of 275° F., and discharge it at that of 120° F., the fraction of heat which it can convert into work will be $\frac{275-120}{275+461}$ or about 21 per cent. of the total heat of the fluid. This proportion would be, of course, greatly reduced in practice, owing to imperfections in the machinery, but these being equally likely to occur in all prime movers, need not be considered here. The *lowest* limit of temperature available being practically constant, fixed either by the temperature of the atmosphere, or that obtainable in a condenser; it follows that greater economy can be looked for only in the direction of increase of initial temperature. In ordinary steam-engines, in which the pressure and temperature increase simultaneously, the latter is limited by the former, which in its turn is kept, by considerations of safety, comparatively low. When, however, *superheated* steam (steam to which additional heat has been imparted without the corresponding addition of pressure) or heated air is used, the temperature is limited only by the power of the metals composing the machine to resist the destructive action of heat, or the chemical action of the fluid at that temperature. Heated air possesses the advantage over superheated steam as a motive power, that with it an explosion, in the usual sense of the word, is rendered almost impossible, and that,

*The law is the same for steam, air, or *any other fluid whatever*

if one were to occur, it would be comparatively harmless. It also, of course, enables the boiler to be dispensed with.

Air-engines, in their principal working parts, are very similar to ordinary steam-engines. The heated air is introduced into a cylinder, in which works a tightly-fitting piston, which is thus compelled to move up and down, and transfer its motion to a revolving shaft by means of a piston and connecting-rod in the usual manner. The motion of the piston results in all cases from the expansion of the heated air; the air is heated by means of a furnace, is introduced below the piston, raises it, and then is allowed to escape into the atmosphere. Air-engines are almost invariably single-acting; they are sometimes worked simply by heated air, and sometimes with the air which, having passed through the furnace, is mixed with all the gaseous products of combustion. The latter method has the immense advantage that it utilizes the heat which would otherwise be rejected into the chimney. The total efficiency of the machine is thus increased, although the efficiency of the engine proper, between the given pair of temperatures, remains the same

The more heat carried away by the discharged air—the higher its temperature, in other words—the smaller evidently is, *ceteris paribus*, the range of temperature of the machine and the less, therefore (as already explained), will be its efficiency. The distinctive principle of the Messrs. Stirling's air-engine, as of the later C. E., consists in utilizing a great part of this wasted heat, and thus economizing fuel. This is effected by means of a 'regenerator,' or, more properly, 'economizer,' consisting of a chamber filled with metallic sieves of wire-gauze, through which the hot air is made to pass *outward* from the cylinder, after having performed its work on the working-piston of the engine. As much of the heat of the escaping air is taken up by the regenerator, and its temperature thus reduced, the range of temperature of the machine is correspondingly increased. The fresh air entering the cylinder for the next stroke was compelled to pass *inward* through the regenerator, and abstracted from it the heat left in it. In this way it did not require to receive so much heat in the furnace as would otherwise have been the case, and thus it economized fuel.

This method of preventing waste of heat was first discovered by the Rev. Dr. Stirling, who obtained a patent for it 1816. In working with air at the ordinary pressure of the atmosphere, however, the engine was found to require to be of large dimensions as compared to a steam-engine of the same power; and in order to obviate this objection, compressed air was used, the idea originating with Mr. James Stirling, C.E. Several other difficulties were successfully surmounted by the Messrs. Stirling, and eventually two improved engines were constructed, one of which was tested to fully 40 horse-power. This latter engine did all the work of the Dundee Foundry Company regularly for upward of three years, during which period they employed no other motor. At the end of this period it

was laid aside, principally owing to the repeated failure of one of the heating vessels.

Capt. Ericsson, in his attempt to introduce his C. E. in the large ship which bore his name, and was tried in New York harbor, experienced precisely the same difficulties and disappointments, and tried nearly the same remedies as the Messrs. Stirling. Some have thought, however, that he actually believed his 'regenerator' was to make the *same heat* do work over and over again—to be a kind of perpetual motion; if so it is not to be wondered at that his machines entirely failed, and that in two years (1855) they were replaced by steam-engines. On a small scale, engines on a somewhat similar principle have worked satisfactorily.

Air engines have recently been constructed, in which the solar rays, concentrated by means of an arrangement of mirrors, are utilized as the source of heat. These have been called *solar* engines.

CALOT'ROPIS: see MUDAR.

CALOTTE, n. *kă-lŏt'* [F.]: a skull-cap; a cap worn on the top of the head as an ecclesiastical ornament in France.

CALOTTISTES, *kă-lŏt'tĭsts* (*Le Régiment de la Calotte*): society of witty and satirical men, in the time of Louis XIV., headed by two officers in the king's body-guard, named Torsac and Aimon. Their name was taken from the word *calotte* (a 'small cap,' worn by monks over the tonsure), and their amusement consisted in sending to any public character who had exposed himself to ridicule, a 'patent,' authorizing him to wear the *calotte* as a covering for the weak part of his head. The armorial bearings of the *Régiment de la Calotte* consisted of various symbols of folly, with the motto, '*C'est régner que de savoir rire.*' When Torsac, its first 'generalissimo' died, the society—which occupied a position of satirical hostility to the French Academy—drew up a burlesque funeral oration, manufactured out of the pompously eulogistic phrases that the academicians were in the habit of using. As the society became audacious, and did not spare even royalty itself, it was dissolved by the minister Fleury. The *Mémoires pour servir à l'Histoire de la Calotte* (Basel, 1725) is an amusing little book. During the Restoration, the title *Régime de la Calotte*, was applied to the priestly administration of affairs.

CALOTYPE, n. *kăl'ō-tīp* [Gr. *kalos*, beautiful; *tupos*, a type or stamp]: a photographic process. The C. process comprehends a variety of methods for the production of negative photographs on paper; and was so named by the inventor, the late Dr. H. Fox Talbot, who exhibited the result of his experiments in 1840. The *principle* involved in the C. P. depends on the susceptibility to the action of daylight of a surface chemically prepared, and the *practice* consists in the preparation, and exposure in the camera, of a sheet of paper, having on one surface an even and finely divided layer of iodide of silver, nitrate of silver,

and an organic acid; the image obtained on this surface being subsequently developed with gallonitrate of silver. One process—the best—for imparting a high degree of sensibility to the paper, is as follows:

Good paper, sized with gelatine, should be chosen, the starch-sized papers being unsuitable, on account of the solutions sinking in too deeply, and thus impairing that sharpness of outline which should be possessed by a good negative. The paper is then floated on one side, and for a moment only, on a solution of iodide of silver in iodide of potassium, prepared by adding freshly precipitated iodide of silver to a *strong* solution of iodide of potassium. It is then dried, and plunged into a dish containing distilled water, which, by removing the soluble iodide of potassium, precipitates the iodide of silver in an even and finely divided condition over the whole surface of the paper, which in this state will keep good for twelve months. It is now ready to receive the *sensitive coating;* this operation, termed *exciting* the paper, is performed in the following manner: Two solutions are prepared—one, a saturated solution of gallic acid in cold distilled water, termed solution A; the other, a solution of 50 grains of nitrate of silver in one ounce of distilled water, to which one drachm of glacial acetic acid has been added; this is termed solution B. The iodized paper obtained as above is now laid on a board having a piece of clean blotting-paper on it a little larger than the paper to be excited, and the following solution brushed over it with a clean Buckle's brush—distilled water, 1 oz.; solution A, 15 drops; solution B, 15 drops. This mixture, prepared in a chemically-clean glass vessel, should be freely applied, and the excess absorbed by clean blotting-paper, The paper is now ready for exposure in the camera, and may be at once placed in the dark slide; or a stock may be thus sensitized, and preserved between folds of blotting-paper until required for use. The *time of exposure*—varying from three minutes to a quarter of an hour—is determined by the diameter and focal length of the lens employed, the aperture of the diaphragm or stop, and the amount of light prevailing at the time. The *development of the latent image*, an operation which, like the preceding, is of course conducted in a room illuminated only by yellow light, is accomplished be applying freely and uniformly over the whole surface solution A; and when the image begins to appear, applying a second quantity, to which a few drops of solution B have been previously added, to increase the intensity. The whole operation of development occupies about a quarter of an hour; and when the details are fully out, the picture should be washed with water, and *fixed*, by immersion in a solution of 1 part of hyposulphite of soda to 4 parts of water; it is then again freely washed in frequent changes of water during several hours; it is lastly *dried* and *waxed;* when it may be regarded as a finished negative, from which positive prints may be obtained, having the lights and shadows as in nature. See POSITIVE PRINTING.

CALOYER, n. *kă-loy'ĕr* [mod. Gr. *kalŏgĕros*, a monk—from Gr. *kălos*, good; *gĕrōn*, an old man]: general name for

the monks of the Greek Church. The Caloyers follow the order of St. Basil, and are in three ranks: the novices, *Archari;* the ordinary professed, *Microchemi;* and the more perfect, *Megalochemi.* It is always from among them that bishops and patriarchs are chosen, because they are generally members of the most distinguished families of the upper and middle classes. The Caloyers also furnish the only learned theologians in Greece at the present day. Their monasteries are very numerous. The most celebrated in Asia is that of Mount Sinai, founded by the Emperor Justinian, and endowed with a revenue of 60,000 crowns. In Europe, Mount Athos alone has 20, the inmates of which have so great a reputation for sanctity that even the Turks seek an interest in their prayers. The Caloyers are obliged to labor for the benefit of their monastery as long as they continue in it. Their religious services occupy an unnaturally large portion of their time, beginning at midnight, and continuing at intervals until sunset. They observe four Lents: the first, of eight weeks, in commemoration of the resurrection of our Lord; the second, of three weeks, in honor of the holy apostles; the third, of fourteen days, in commemoration of the Assumption of the Virgin; and the fourth in commemoration of the Advent.—Their are also female Caloyers, or Greek nuns, who likewise follow the rule of St. Basil.

CALPE: see HERCULES, PILLARS OF.

CALPEE, *kăl'pē* (*Kálpi*): town in the dist. of Jalaun, in the N. W. Provinces of India, on the right bank of the Jumna, lat. 26° 7′ n., long. 79° 48′ e. It is an entrepôt for the cotton of the neighboring district. It has manufactures of cotton and paper, and is celebrated for the excellence of its refined sugar. It became British by capture and cession, respectively, 1803 and 1806. It is 51 m. s.w. of Cawnpore, and is closely linked with it in the history of the insurrection of 1857–58, as the headquarters of the Gwalior Contingent. Pop. 18,000.

CALPENTYN, *kăl-pĕn-tīn':* long and narrow peninsula on the w. side of Ceylon, lat. 8° 14′ n., long. 79° 53′ e. The neck is so low as to be overflowed during the n.e. monsoon, so that it is transformed into an island.

CALPURNIUS, *kăl-pŭr'nĭ-ŭs:* name of a gens in ancient Rome (see GENS). The Calpurnia gens was, by its own account, one of the oldest plebeian clans in Rome, but it does not figure in history till the time of the first Punic war. The family names, in the time of the Republic, were Bestia, Bibulus, Flamma, and Piso.

MARCUS CALPURNIUS BIBULUS, d. B.C. 48, is known as the hostile but incapable colleague of Cæsar (q.v.) in the consulate. He was put up by the aristocratic party, who spent vast sums to carry the election. He finally joined the Pompeian party, had command of the fleet intended to prevent Cæsar's passage to Greece, and died before the battle of Dyrrhachium.

CALPURNIA, daughter of Calpurnius Piso (consul B.C. 58), and the last wife of Cæsar, seems from the scanty notices

which remain, to have been a quiet domestic woman, full of love and solicitude for her great husband.

CALPURNIA, daughter of L. Calpurnius Bestia, wife of P. Antistius, killed herself B.C. 82, when her husband was murdered by order of the younger Marius.

CALTABELLOTA, *kâl-tâ-bĕl-lŏt'tâ* [Saracenic, the Castle of the Cork-trees]: town of Sicily, Girgenti, 7 m. n.e. of Sciacca, most picturesquely situated around an ancient castle, which crowns a steep rock overhanging a stream (ancient *Crimisus*), of the same name as the town. Of its churches the *Chiesa Matrice* is a beautiful relic of the middle ages, resembling a mosque, with a single row of columns down the middle. The town was captured by the Saracens 840. Pop. 6,200.

CALTANISETTA, *kâl-tâ-nē-sĕt'tâ:* province of central Sicily, bounded n. by Palermo, e. by Catania, s. by the Mediterranean, w. by Girgenti; it has three districts. C. produces cattle, wine, olive oil, cotton, hemp, and almonds, besides marble, sulphur, and other minerals. There are iron works and manufactories of chemicals. Area, 1,455 sq. m. Pop. 330,972.

CALTANISETTA: fortified town of Sicily, on a fertile plain near the Salso, about 28 m. n.e. of Girgenti. It has mineral springs and extensive sulphur-works. Pop. 44,600.

CALTHA, the genus of ranunculaceous plants to which the marsh-marigold (*C. palustris*) belongs. See COWSLIP; MARSH-MARIGOLD.

CAL'THROP, SAMUEL ROBERT, American Unitarian clergyman: b. Swineshead Abbey, Lincolnshire, England, 1829, Oct. 7. He was educated at Cambridge Univ. and came to the United States in 1853. He entered the Unitarian ministry in 1860 and has been pastor of a church in Syracuse, N. Y., for several years. He has published *Essay on Religion and Science; The Rights of the Body; The Primitive Gospel and Its Life of Jesus; One Lord and His Name One; Gold and Silver as Money; The Transvaal, Venezuela, and Armenia; The Wars of* 1898*; The Great Synthesis; Experimental Theology and Experimental Religion; God in His World,* etc.

CALTONICA, *kâl-tō-nē'kâ*, Sicily, a town in the province of Girgenti, situated 15 miles northwest of the town of Girgenti. The sulphur works in the neighborhood produce annually upward of 1,000 tons of sulphur. Salt is also manufactured in the district. Pop. 7,000.

CALTROP, or CALTHROP, n. *kăl'trŏp* [AS. *coltræpe*, a species of thistle]: in Military Affairs, a four-pronged piece of iron, each prong about four inches in length, to be placed in ditches or breaches, or strewn over plains to arrest besieging troops, or an enemy's cavalry. The C. is so shaped that one prong is sure to stand upright, and may work terrible mischief to the enemy's horses or men.—C. is the name also of a plant whose fruit is armed with spines, species of *Trībŭlus*, o.o. *Zyg'ophyllāceæ*.

CALUMBA, n. *kă-lŭm'bă* [*kalumb*, the name given to it in Mosambique]: root of *Cocculus palmatus*, herbaceous plant of the nat. ord. *Menispermaceæ* (q.v.), extensively used in medicine. It is said to derive its name from Colombo in Ceylon, although the calumba now chiefly in use is the product of Mosambique. The flowers in this genus have 12 sepals and petals in all, similar in appearance, and disposed in four rows. The male and female flowers are on separate plants. *C. palmatus* has nearly circular leaves with 5–7 lobes, on long, hairy foot-stalks, and solitary axillary racemes of small green flowers, the racemes of the male plants branching. The fruit is a drupe, or 1-seeded berrylike fruit, about the size of a hazel-nut, densely clothed with long hairs. The stem is annual and twining; the root perennial, consisting of clustered spindle-shaped fleshy tubers with a brown warty epidermis, and internally deep yellow. The plant is not cultivated; the root is collected where it grows wild in dense forests. It is dug up in March, cut into slices, or short cylindrical pieces, and dried in the shade. In this state it appears in commerce, having a greenish-yellow tint, a very bitter taste, and a faint aromatic odor. Its bitterness is ascribed to a somewhat narcotic principle called Calumbin or Calumbine (bitter extract of Calumba root), and to *Berberine*, an alkaloid originally discovered in the Barberry (q.v.), which also is present in it. C. is regarded as one of the most useful stomachics and tonics. It is demulcent, not at all stimulant, and capable of being used in cases in which almost every other tonic would be rejected by the stomach. It is sometimes given to allay vomiting. It has been found very useful in diarrhea and dysentery. It is administered in the form of powder, infusion, or tincture. Similar properties seem to reside in the roots of the species of *Cocculus* generally.—The very poisonous seed known by the name of Cocculus Indicus (q.v.) belongs to a plant of a different though allied genus. The root of *Frasera Walteri* is sometimes fraudulently substituted for calumba, and has been called American Calumba Root. It does not agree with calumba in its properties, but, besides its very different appearance, it may be distinguished by its undergoing no such change of color when touched with tincture of iodine as in true Calumba Root is occasioned, produced by the presence in it of starch: see Frasera.

CALUMET, n. *kăl'ū-mĕt* [F.—from mid. L. *calamel'lus*, and *calamet'tus*, dim. of L. *calămus*, a reed]: American

Calumet, or Pipe of Peace.

reed plant whose stems were used as pipe-stalks. The 'peacepipe' of the N. American Indians is a tobacco-pipe having a stem of reed about two ft. and a half long, deco-

rated with locks of women's hair and feathers, and a large bowl of polished marble. It has an important place in the conclusion of treaties, of which it may be described as the ratifier. After a treaty has been signed the Indians fill the Calumet with the best tobacco and present it to the representatives of the party with whom they have been making treaty, themselves smoking out of it afterward. The presentation of it to strangers is a mark of hospitality, and to refuse it would be considered an act of hostility.

CALUMET: village in Calumet township, Houghton co., Mich., 12 m. from Hancock, 15 m. from Houghton, towns noted for their immense shipments of copper. Calumet is built on an inclined system of rocks known to geologists as the copper-bearing series, and to miners as the copper mineral range. It was founded by the corporation that owns the Calumet and Hecla mine, one one of the richest copper mines in the world, for the accommodation of the operatives, and is (1888) a thriving place, provided by the corporation with excellent religious, educational, and benevolent institutions. It has a post-office, bank, several churches, newspapers and a good school system. Thirteen languages are spoken there. The rock beneath it varies from 10 to 15 ft. in thickness and extends to an unknown depth, the mainshaft of the mines having already reached a point nearly 2,500 ft. below the surface. The copper obtained there is pure metal, not ore that has to be smelted. In a single year (1902) these mines yielded the enormous amount of 39,982 tons of pure copper, about 1-13 the entire product of the globe; and since they were first operated more than 150,000 tons, valued above $90,000,000 have been taken at comparatively little cost from them.

CALUMNIATE, v. *kă-lŭm'nĭ-āt* [L. *calum'nĭātus*, attacked with false accusations—from *calumnĭă*, a malicious slander: F. *calomnie*]: to accuse falsely and maliciously; to slander; to spread evil reports of any one maliciously. CALUM'NIATING, imp. CALUM'NIATED, pp. CALUM'NIATOR, n. *-tėr*, one who calumniates; a false accuser. CALUM'NIA'TION, n. *-ā'shŭn*, false and slanderous representations. CALUM'NIOUS, a. *-nĭ-ŭs*, slanderous; injurious to character. CALUM'NIOUSLY, ad. *-lĭ*. CALUM'NIA'TORY, a. *-tėr-ĭ*, slanderous. CALUMNY, n. *kăl'ŭm-nĭ*, slander; false accusation; the making and spreading of reports injurious to character: for the law as to calumny see LIBEL.—SYN. of 'calumniate': to asperse; slander; defame; vilify; villipend; lampoon; libel; traduce; backbite; bespatter; blacken; belie; —of 'calumny': aspersion; detraction; defamation; reviling, etc.

CALUSO, *kâ-lô'so:* town of n. Italy, in Piedmont, province of Turin, about 11 m. s. of Ivrea, and connected with Turin by railway. Pop. 3,500.

CALVADOS, *kâl-vâ-dos':* maritime dept. in the n.w. of France; bounded n. by the English Channel, and e., w.

and s. by the depts. of Eure, Manche, and Orne; area 2,130 sq. m. It is formed of a part of the old province of Normandy, and is divided into six arrondissements. Its cap. is Caen. The principal rivers are the Touques, Orne, Dives, Seulle, Dromme, and Vire. The coast, which has few bays or inlets, is partly bold ridges, and partly sand-dunes, cliffs, and reefs. The reef between the mouths of the Orne and the Vire, called Calvados, after one of the vessels in the Spanish Armada wrecked on it, and from which the dept. takes its name, is very dangerous to navigation. The soil of the dept. is generally fertile, especially in the valleys, supplying rich pasturage for horned cattle, sheep, horses, and swine, the principal wealth of Calvados. The climate is healthful, though changeable. Iron, marble, slate, and coal are found. There are various manufactures, and the coast-fisheries are of some importance. Pop. (1901) 410,178.

CALVAERT, *kâl-vârt'* or *kâl-vâr'*, Dionys (called also Dionisio Flammingo): 1555–1619; b. Antwerp: distinguished painter, especially in landscape. He settled early in Bologna, where he opened a school, and had among his students the celebrated Domenichino, Guido, and Albani, who were afterward, however, pupils of the Caracci. Many excellent pictures by him are preserved at Bologna.

CALVARY, n. *kăl'vă-rĭ* [L. *calvārĭă*, the skull of a man or beast, a smooth rounded rock like a skull—from *calva*, the scalp without the hair: F. *calvaire*, Calvary]: the place where Christ was crucified. All that is known of the locality is that it was outside, though near, the wall of Jerusalem, and in sight from a public road. None of the localities assigned by tradition can be identified as the actual scene of the crucifixion. They all are *within* the walls of the present city; but Hadrian made such great changes in the former limits and structures, that some of these places may have been outside the ancient wall. The expression 'Mount Calvary,' common throughout Christendom for a thousand years, is not met with in any ancient writer till 300 years after the death of Christ. Though it is not known that Calvary was a mount, this may be conjectured from its name, which may refer to a slight elevation of ground, or to a rock, rounded at top like a skull.

CALVE, *kâl'vā*, Emma, French opera singer: b. Madrid, Spain, 1864. Her real name is Emma de Roquer. She was born of a French mother and Spanish father, and was educated in a convent school in the south of France. She made her début at Brussels in Gounod's *Faust*. She has made successful tours of the United States in leading rôles, her first appearance in New York being in 1893, Nov. 29.

CALVENTURA ISLANDS, *kâl-vĕn-tô'râ:* off the coast of Arracan, in the Bay of Bengal, their centre being in lat. 16° 53′ n., and long. 94° 20′ e. The group consists of two divisions—one to the s.e., composed of two lofty and well-

wooded islets; the other to the n.w., seven bare rocks, chiefly of fantastic shapes.

CALVERED, a. *kăl'vėrd* [Scot. *caller*, fresh]: in *OE.* and *Scot.*, applied to salmon dressed and cooked as soon as caught; crimped.

CALVERLEY, *kăl'vėr lĭ*, Charles, American sculptor: b. Albany, N. Y., 1833, Nov. 1. He has won distinction with groups and figures and portrait busts of Greeley, Cooper, Howe, etc. He was elected to the National Academy of Design in 1875.

CALVERLEY, Charles Stuart, English poet, son of the Rev. Henry Blayds: b. Martley, Worcestershire, 1831, Dec. 22; d. London, 1884, Feb. 17. In 1852 his father dropped the name of Blayds and resumed that of Calverley, formerly borne by his family. He was educated at Christ's College, Cambridge, and during his college career showed great skill in Latin and Greek composition, and in 1856 was second in the classical tripos. As a writer of humorous English verse he also made himself famous. He afterward studied for the bar, and was called in 1865, but his promising legal career was cut short by a serious accident which befell him on the ice in the winter of 1866–7. The earliest verses appeared in 1862 under the title of *Verses and Translations;* and the others are *Translations into English and Latin* (1866); *Theocritus Translated into English Verse* (1869); and *Fly Leaves* (1872). A *Memoir and Literary Remains* were published in 1885 by Sendall.

CALVERT, *kăl'vėrt*, George Henry, American writer: b. Baltimore, Md., 1803, Jan. 2; d. Newport, R. I., 1889, May 24. He was a great-grandson of Lord Baltimore. After graduating at Harvard in 1823, he studied in Germany; then returning to Baltimore, became editor of the *American* and a contributor to various periodicals. His published books include *Poems* (1847); *Joan of Arc* (1860); *Goethe, his Life and Works* (1872); *Brief Essays and Brevities* (1874), and *Wordsworth a Biographic Æsthetic Study* (1875); *Three Score and Other Poems* (1883).

CALVERT, Leonard: 1606–47, June 9: first gov. of Md. Its proprietor, Calvert's elder brother, the second Lord Baltimore, sent Calvert to superintend the colony. With two vessels and 200 persons he sailed from Cowes, 1633, Nov. 22, landed at Point Comfort, Va., 1634, Feb. 24, sailed up the Chesapeake to St. Clement's Island, and founded St. Mary's, Mar. 27. A previous settler, W. Clayborne, of Kent Island, refused to acknowledge Calvert's authority and was dispossessed, but returned and gave trouble, 1644, 5. The Rom. Cath. religion was established by act of assembly, 1639, but large toleration was granted to all forms of faith, and persecution explicitly forbidden about 10 years later, so that Maryland became an asylum for those whom Puritan severity excluded from New England.

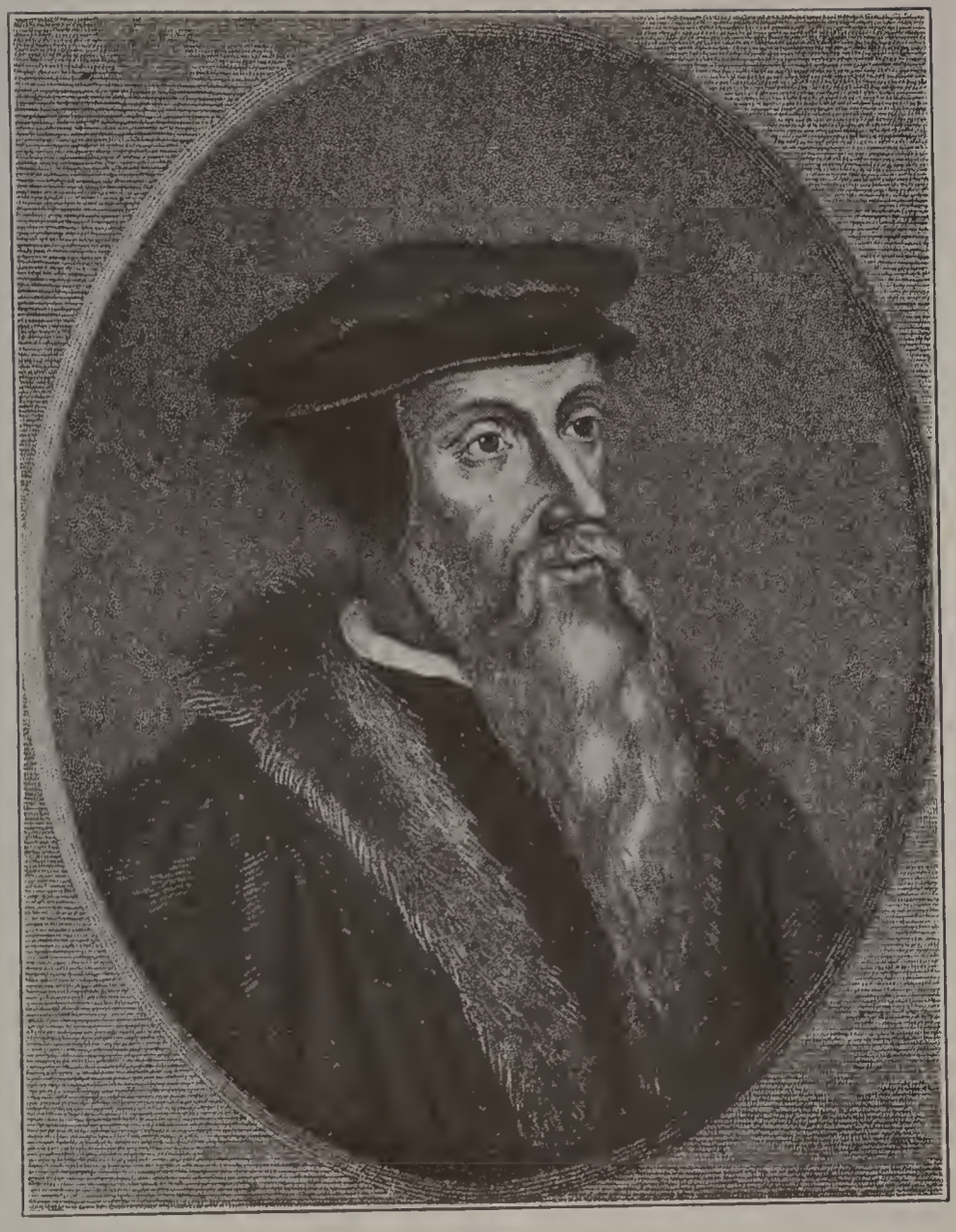
CALVILLE, *kăl'vĭl:* kind of apple, of which there are numerous sub-varieties. The calvilles diminish in thickness from the middle toward the calyx, where they form a point; they have regular ribs, and a large open seed-chamber; also a pleasant smell, and are unctuous to the touch. They are never altogether streaked; they have a fine loose flesh, with a flavor somewhat like that of the raspberry or strawberry. The White Winter C. is in high repute both as a culinary and dessert apple; it is extensively cultivated on the continent of Europe.

CALVIN, *kăl'vĭn*, JOHN: theologian and reformer: 1509, July 10—1564, May 27; b. Noyon, in Picardy, France. His father, Gerard Cauvin or Calvin, was procureur-fiscal of the dist. of Noyon, and sec. of the diocese. John was one of six children—four sons and two daughters. All the three sons who survived were bred ecclesiastics; and the reformer himself, while still only 12 years of age, was appointed to a chaplaincy in the cathedral church of Noyon. This he held as a means of support during the period of his education, and even for some short time after he had entered on his reforming career. C. was educated in circumstances of ease, and even affluence. The noble family of Mommor, in the neighborhood, invited him to share in the studies of their children; he was in some measure adopted by them; and when the family went to Paris, in his 14th year, he accompanied them, and participated in the benefits of the higher instruction there attainable. He was entered as a pupil in the Collége de la Marche, under the regency of Mathurin Cordier, better remembered, perhaps, by his Latin name of Corderius. It was under this distinguished master that C. laid the foundation of his own wonderful mastery of the Latin language. During this early period, he was distinguished by the great activity of his mental powers, and the grave severity of his manners. His companions, it is said, surnamed him the 'Accusative.'

For awhile his attention was directed to the study of law. His remarkable talents seemed to promise great success in this branch of study, and his father sent him, with the view of prosecuting it, to the Univ. of Orleans, then adorned by Pierre de l'Étoile, one of the most famous jurists of his day, afterward pres. of the parliament of Paris. At Orleans he continued the same life of rigorous temperance and earnest studiousness for which he was already noted. Beza says, that, after supping moderately, he would spend half the night in study, and devote the morning to meditation on what he had acquired. His habits of inordinate study seem to have laid thus early the foundation of the illness of his later years. It was while a law-student in Orleans that he became acquainted with the Scriptures, and received his first impulse to the theological studies which have made his name so distinguished. A relative of his own, Pierre Robert Olivetan, was there engaged in a translation of the Scriptures; and this had

the effect of drawing C.'s attention, and awakening within him the religious instinct soon to become the master-principle of his life. It is not known that as yet his traditionary opinions were unfixed, or that he had embraced with any decision the Protestant opinions that were spreading everywhere; but the seeds of the new faith were now beyond doubt sown in his heart, and from this time, though he still continued for a while his legal studies, his main interests appear to have been religious and theological. From Orleans he went to Bourges, where he acquired the knowledge of Greek, under the tuition of a learned German, Melchior Wolmar, to the influence of whose spiritual instructions also he was greatly indebted. He began here to preach the reformed doctrines, and passed over into the ranks of Protestantism, under the slow but sure growth of his new convictions, rather than under the agitation of any violent feeling. Here, as everywhere, his life presents a marked contrast to that of Luther.

He went, 1533, to Paris, then a centre of the 'new learning,' under the teaching of Lefevre and Farel, and the influence of the queen of Navarre, sister of Francis I. The Sorbonne itself had not escaped the infection. There was a growing religious excitement in the university, in the court, and even among the bishops. This, however, was not to last. The king was soon stirred up to take active measures to quell this rising spirit; and the result was that C. and others were obliged to flee for their lives. The story is that C. narrowly escaped, having descended from his window by means of his sheets, and fled, under the guise of a vine-dresser, a friend of his, in whose clothes he concealed himself. After this he returned for a short time to his native place, resigned the preferment which he held in the Rom. Cath. church, and for a year or two led a wandering life, sheltered in various places. He was at Saintonge; at Nerac, residence of the queen of Navarre; at Angoulême, with his friend Louis Tillet; then for a brief while at Paris again, in the strange expectation of a meeting with Servetus, who had expressed a desire to confer with him. Persecution against the Protestants at this time raged so hotly, that C. was no longer safe in France; and he betook himself to Basel, where he is supposed to have prepared the first edition of the *Institutes of the Christian Religion*, and whence he certainly issued, 1535, the famous preface addressed to Francis I. The concentrated vigor of this address, its intensity of feeling, rising into indignant remonstrance, and at times a pathetic and powerful eloquence, make it one of the most memorable documents in connection with the Reformation. It is throughout a noble defense of the righteous character of the reformed doctrines, and their support alike in Scripture and in history. The energetic decisiveness and moral zeal of the future teacher and legislator of Geneva, speak in every page of it. After completing this great service to Protestantism, he made a short visit in Italy, to Renée, Duchess of Ferrara. Finally, he revisited his native town; sold the paternal estate, which had devolved to him on



CALVIN.

the death of his eldest brother; and bidding it adieu, set out in company with his younger brother and sister on his way to Strasburg. The direct road being rendered dangerous by the armies of Charles V., which had penetrated into France, he sought a circuitous route through Savoy and Geneva.

The result of this journey was memorable for the cause of the Reformation. Arrived in Geneva, he met there his friend, Louis Tillet, who communicated the fact of his arrival to Farel, then in the very midst of his struggle to promote the Reformation in the city and neighborhood. Farel hastened to see him, and urge upon him the duty of remaining where he was, and undertaking his share of the work of God, under the burden of which he was like to fail. C. did not at first respond to the call. He was given, he himself says, to his 'own intense thoughts and private studies.' He wished to devote himself to the service of the reformed churches generally, rather than to the care of any particular church. A life of intellectual and theological labor was that which at that time was most congenial to him. By some strange insight, however, Farel penetrated to the higher fitness of the young stranger who stood before him, and he ventured, in the spirit of that daring enthusiasm which characterized him, to lay the curse of God upon him and his studies if he refused his aid to the church of Geneva in her time of need. This seemed to C. a divine menace. 'It was,' he said, 'as if God had seized me by his awful hand from heaven.' He abandoned his intention of pursuing his journey, and joined eagerly with Farel in the work of reformation.

Thus began C.'s great career in Geneva. Having entered upon his task, he soon infused an energy into it which crowned the struggling efforts of Farel with success The hierarchical authority was already overturned before his arrival; the citizens had asserted their independence against the Duke of Savoy, whose alliance with the corrupt episcopate, which was the direct governing influence in the place, had called forth the patriotic as well as the religious feelings of the people. The magistrates and people eagerly joined with the reformers in the first heat of their freedom and zeal. A Protestant Confession of Faith was drawn out, approved of by the Council of Two Hundred, the largest governing board of the city, and then proclaimed in the cathedral church of St. Peter's as binding upon the whole body of the citizens. Great and marvellous changes were wrought in a short time upon the manners of the people; where license and frivolity had reigned, a strict moral severity began to characterize the whole aspect of society. The strain, however, was too sudden and too extreme. A spirit of rebellion to the rule of C. and Farel broke forth; the two reformers refused to yield to the wishes of a party animated by a more easy and liberal spirit than themselves, and known in the history of Geneva under the nickname of Libertines; and the consequence was, that they were both expelled from the city after less than two years' residence.

C. retreated to Strasburg, where he had meant to go when arrested in his course at Geneva. Here he settled, and devoted himself to theological study, and especially to his critical labors on the New Testament. Here, also, 1539, Oct., he married the widow of a converted Anabaptist. The marriage appears to have proved a happy one, although not of long duration.

The Genevans found, after a short time, that they could not well dispense with Calvin. His rule might be rigid; but an authority, even such as his, which might gall from its severity, was better than no settled authority at all; and the Libertine party seem to have been unable to construct any efficient and beneficent form of government. Accordingly, the citizens invited C. to return; and after some delay on his part, in order to test the spirit in which they were acting, he acceded to their invitation, and in the autumn of 1541, after three years' absence, once more made his entry into Geneva.

Now, at length, he succeeded in establishing his plan of church-government, in all its forms and details. By his College of Pastors and Doctors, and his Consistorial Court of Discipline, he founded a theocracy, with himself at the head of it, which aimed virtually to direct all the affairs of the city, and to control and modify both the social and individual life of the citizens. Not without a struggle, it may be supposed, did he succeed in his great autocratic scheme. The Libertines, though dishonored by their ineffectual attempts to maintain order in the city, and uphold its rights and dignity, still remained a strong party, which was even augmented, after C.'s return, by men such as Amy Perrin, who had strongly concurred in the invitation to C., but who were afterward alienated from him by the high and arbitrary hand with which he pursued his designs, as well as by their own schemes of ambition. The struggle with this party lasted with various fortune for no less than 15 years, and was only terminated in 1555, after a somewhat ridiculous *émeute* in the streets. Amy Perrin and others, driven from the city, were put to death in effigy; and there former's authority from this date confirmed into absolute supremacy.

During this long struggle with the Libertines, C. had many other disputes, in which he conducted himself with no less heartiness and zeal. The most remarkable of these were his controversies with Sebastian Castellio, Jerome Bolsec, and above all, Michael Servetus.

C. had become acquainted with Castellio at Strasburg. They entertained at first a warm friendship for each other, and C. showed great zeal in assisting Castellio, whose poverty and learning had attracted his sympathy. When he returned to Geneva, he invited Castellio to join him there, and procured for him the title of regent or tutor in the gymnasium of the city. There was little similarity, however, in the characters of the two men, and the diversity of their tastes and views soon became apparent. The learning of Castellio was intensely humanitic; a classical spirit and a somewhat arbitrary opinionativeness molded all his

studies; and as soon as he began to apply himself to the theology, he came into contact with Calvin. In a letter to Farel, 1542, C. speaks of the freaks of 'our friend Sebastian, which may both raise your bile and your laughter at the same time.' These freaks relate to Castellio's notions of Scriptural translation, and his refusal of C.'s offer to revise the version which he had made of certain parts of Scripture. Then, two years later, when Castellio desired to enter into the ministry, C. dissuaded the council from accepting him, on account of some peculiar opinions which he held. These were certain rationalistic views as to the authenticity and character of the Song of Solomon, the descent of Christ into hell, and also about election. After this, Castellio left Geneva for a while, but soon returning, he attacked the views of C. openly. After a violent scene in church, which is painted in C.'s letters very strongly, he was forced to leave the city. The two old friends, now declared enemies, did not spare each other henceforth. The fate of Servetus drew forth an anonymous publication, attacking with keen logic and covert and ingenious sarcasm the Genevan doctrines. This publication was attributed by both C. and Beza to Castellio, and they replied to him in no measured terms, stigmatizing him as a 'deceiver and vessel of Satan.' One fact really disgraceful to C. in the controversy deserves not to be passed over. Sunk in great poverty, Castellio was obliged, in his old age, to gather sticks on the banks of the Rhine at Basel, as a means of support. C. did not hesitate to accuse him of stealing the sticks—a dismal instance of polemical truculence which may well make us turn away in disgust and indignation.

The controversy with Bolsec belongs to a later period. Jerome Bolsec, originally a Carmelite monk, had thrown aside the habit, and betaken himself to the practice of medicine in Geneva. He was led to attack C.'s doctrine of predestination. As soon as C. heard of this he led him to understand that he was not at liberty to question the Genevan doctrine. He and the other clergy dealt with him; but after repeated disputations Bolsec was found incorrigible, and was sentenced to banishment from the city. Cast out of the theocratic community, he ultimately rejoined the Rom. Cath. Church, and revenged himself in a somewhat mean way against C. by writing his life in a spirit of detraction and slander.

Of all these contests, however, the most memorable is that with Servetus. A melancholy interest encircles the name of this great heretic, which the criminal tragedy of his death keeps always fresh and vivid in the minds of all who hate intolerance, and who love truth above dogmatism. The character of Servetus himself has little to do with this interest. He seems to have been more a vain, restless, and enthusiastic dreamer, than a calm and patient inquirer. In his very dreams, however, and the vague audacities of his speculation, there is a kind of simplicity and unconscious earnestness that wins sympathy. He had entered into various connections with C., even from the

time of his early residence in Paris; particularly, he had sent him various documents containing the views fully developed in his work subsequently published under the title of *Restitutio Christianismi*. C. never concealed his abhorrence of these views; and in a letter to Farel as early as 1546, he threatens that if Servetus should come to Geneva he would do what he could to bring him to condign punishment: *Nam si venerit, modo valeat mea authoritas, vivum exire nunquam patiar*. The history of his seizure and condemnation at Vienne by the Rom. Cath. authorities, and especially of C.'s share in the correspondence which led to his seizure, is very complicated and obscure. It has been maintained that C. was the instigator, through a creature of his own of the name of Trie, of the whole transaction; it *is certain* that he forwarded to the authorities, through Trie, private documents which Servetus had intrusted to him, with a view to the heretic's identification, and as materials for his condemnation. Servetus was sentenced to be burned, but effected his escape, and, after several months' wandering, he was found at Geneva. It was his intention to proceed to Italy, where he hoped his opinions might meet with some degree of toleration, and he arrived at Geneva on his way. This is the explanation of an event otherwise unaccountable. Having ventured to church, according to the common account, he was recognized, apprehended, and conveyed to prison by C.'s order, just as he was about to leave the city. His trial, the particulars of which are full of interest, lasted, with various interruptions, for two months. He attacked C. with the most foul epithets, and C. retorted with a quite equal virulence and foulness. At length, 1553, Oct. 26, sentence was passed upon Servetus, condemning him to death by fire. C. used his influence to have the mode of death alleviated, but without success. On the very next morning the sentence was put into execution. On an extended eminence at some distance from the city, Servetus was fastened to a stake surrounded by heaps of oak-wood and leaves, with his condemned book and the MS. he had sent to C. attached to his girdle; and, amid his agonizing cries, the fire was kindled, and the wretched man expiated his heresy amid the flames. Whatever apologies may be urged for this memorable crime, it will remain a mournful and scandalous blot on the history of the Reformation. The disgrace of it has particularly attached to C., and with some justice, from the special and unhappy relation which he bore to the whole transaction, but most of the reformers are no less implicated in it. The wise Bullinger defended it, and even the gentle Melanchthon could see cause only for gratitude in the hideous tragedy.

After the execution of Servetus, and the expulsion of the Libertines two years later, C.'s power in Geneva was firmly established, and he used it vigorously and beneficently for the defense of Protestantism throughout Europe. By the mediation of Beza, he made his influence felt in France in the great struggle between the hierarchical party, with the

Guises at its head, and the Protestants, led by Condé and Coligny. In 1561, his energies began to fail. He had been long suffering from bad health, but his strength of will and buoyancy of intellect sustained him amid all his bodily weakness. In the year now mentioned, his illness greatly increased, and though he survived for more than two years, he never regained any vigor.

Very different estimates, it may be imagined, have been formed of C.'s character, according to the point of view from which it is contemplated. None, however, can dispute his intellectual greatness, or the powerful services which he rendered to Protestantism. Stern in spirit, unyielding in will, he is never selfish or petty in motives. Nowhere amiable, he is everywhere strong. Arbitrary and cruel when it suits him, he is yet heroic in his aims, and beneficent in the scope of his ambition. Earnest from the first, looking upon life as a serious reality, his moral purpose is always clear and definite—to live a life of duty, to shape circumstances to such divine ends as he apprehended, and, in whatever sphere he might be placed, to work out the glory of God.

He did for Protestantism a double work, which, apart from anything else, would have made his name illustrious: he *systematized its doctrine*, and he *organized its ecclesiastical discipline*. He was at once the great theologian of the Reformation, and the founder of a new church polity, Presbyterianism; and this two-fold work, at that period of transition, did more than all other external influences together to consolidate the scattered forces of the Reformation, and give them an enduring strength. As a religious teacher, as a social legislator, and as a writer, especially of the French language, then in process of formation, his fame is second to none in his age, and must always conspicuously adorn the history of civilization. Among C.'s most important works are: *Christianæ Religionis Institutio* (Basel, 1536); *De Necessitate Reformandæ Ecclesiæ* (1544); *Commentaires sur la Concordance ou Harmonie des Evangélistes* (Gen. 1561); *In Novum Testamentum Commentarii; In Libros Psalmorum Commentarii; In Librum Geneseos Commentarii*. The first edition of C.'s whole works is that of Amsterdam, 1671, 9 vols. fol. A complete critical edition by Baum, Cunitz, and Reuss began to appear at Brunswick, 1869. By the 'Calvin Translation Society,' in Edinburgh, his works have been collected, translated into English, and issued in 51 vols. 8vo. 1843-55. Besides the original *Vita* by Beza, there are lives of C. by Bolsec (from the Rom. Cath. standpoint, 1577, new ed. 1875), Audin (1840), Bungener, Viguet, and Tissot (1864); and in Germany, by Henry (1844), Stähelin (1863), and Kampschulte (vol. i. 1869).

CALVINISM, n. *kăl'vĭn-ĭzm :* the doctrines of *Calvin*, the Swiss Protestant reformer, of which predestination, particular election, and reprobation are leading features. CAL'VINIST, n. one who holds these. CAL'VINIS'TIC, a. *-ĭs'tĭk*, or CAL'VINIS TICAL, a. *-tĭ kăl*

CALVINISM.

CALVINISM, as a doctrinal system, distinguishes the churches more particularly called the Reformed, in distinction from the Lutheran and Anglican churches. Calvin's doctrinal views are laid down at length in his *Institutio Christianæ Religionis*, 1536. It was not till many years later, however, that the name of C. came to be attached to a certain set of doctrinal opinions, and not till the rise of Arminius (q.v.), and the synod of Dort (q.v.), 1618, that these opinions may be said to have been polemically marked off from others with which they are generally contrasted, and to which they are recognized as opposed.

The difference of thought expressed in the Arminian and Calvinistic systems is as old as the history of Christian doctrine. In almost every point, Augustine may be said to have anticipated Calvin; while Pelagius and the eastern divines, such as Chrysostom, represented a type of opinion upon the whole consonant to that which in more modern times has been opposed to Calvinism. In the Rom. Cath. Church, since the Reformation, the same opposition of thought has presented itself in the famous contest of Jansenism and Jesuitism.

The main point of distinction in the two systems or modes of Christian opinion, is as to the operation of divine grace in the salvation of sinners. In the one system, this operation is considered as predetermined and absolute; in the other, as merely prescient, and in some sense conditioned. *Predestination* and *Irresistible Grace* are the great key-notes of C.—its two main points. Others were added in opposition to Arminianism—viz., *Original Sin*, *Particular Redemption*, and the *Perseverance of the Saints;* but the first of these is not peculiarly Calvinistic, and the last two are merely corollaries from the doctrines of Predestination and Grace. Predestination is, in fact, the one distinguishing doctrine of the system, as it was of Augustinianism, of which C. was merely the revival. The divine will apprehended as decretive and predestinating, is necessarily *irresistible* in its efficacy, *select* in its objects, and *persevering* in its results. The characteristic of C., therefore, is that it is a speculative Christian system, springing from a single great principle, carried out rigorously into all its logical consequences.

The Church of England, in its earlier history, was Calvinistic in its creed, though mediæval and Roman Catholic in its ritual. Puritanism was a movement to reduce it in doctrine and practice, though not necessarily in polity, to a Calvinistic model. In the reaction which followed this movement, the Church of England, while retaining its original articles, nearly parted with its Calvinistic faith; and throughout the 18th c., its chief divines are conspicuously Arminian or latitudinarian. But with the revival of the evangelical party in the end of the century, C. revived; and it still maintains a noticeable influence over many minds in the Anglican establishment, while it is the professed creed of a great proportion of the dissenters.

The Church of Scotland, with the other Presbyterian

churches in Britain, and the large and increasing bodies of Presbyterians in America, all hold to the Westminster Confession of Faith, the most elaborate and formal expression of Calvinistic doctrine that exists. But while holding to the same Calvinistic standard, these churches show many varieties of actual opinion; and in the history of Presbyterianism, C. has shown a tendency in its logical development to pass into Rationalism or Unitarianism. This is conspicuously the case in the church of Geneva itself, in the Presb. churches in England previous to the last half-century, and in some of the old Puritan churches of America. There are signs that portions of those bodies that still assent to Calvinism, do not hold the standards with the ancient rigidity and thoroughness. Still, C. doubtless remains, as opposed to Arminian, Socinian, or any cognate forms of the same type of doctrine, the most living and powerful among the dogmatic systems of the Reformation.

CALVINISTIC METHODISTS: in England; Whitefield's connection, established 1741, and that of Lady Huntingdon, 1748. In Wales the movement had an earlier origin and a longer tenure. Howell Harris of Trevecca, Daniel Rowlands of Llangeitha, and Howell Davies of Pembrokeshire began to itinerate 1735-6, independently of each other. Whitefield met Harris at Cardiff 1738, presided at a meeting of 10 clergy and 40 lay exhorters 1742, and at the first formal conference at Waterford, 1743, Jan. 5. After 1748 Whitefield ceased to act as their head, and the organization, always loose, gradually fell to pieces. Harris ceased to itinerate 1751, but the local societies were kept together by lay workers, and inspired by the hymns of Wm. Williams, 'the Watts of Wales.' Rowlands became a dissenter 1763, and labored till 1790. At the latter date, T. Charles of Bala became a leader, and rules for the quarterly association were drawn up. An *Order and Form of Church Govt. and Rules of Discipline* were published 1801, and the preachers were ordained and made pastors, 1811. A thorough organization was not effected till 1864, when the first general assembly met. Its official *Psalms and Hymns* appeared 1870. There are two synods of North and South Wales; the constitution is a modified Presbyterianism. The body has two theol. colleges, at Bala and Trevecca, and carries on missions in Brittany and Bengal. In Gt. Britain (1889) its membership was 130,000. In the U. S. (1890) it had 12,722 communicants, 190 churches, church property $625,875.

CALVO DOCTRINE: known also as the DRAGO DOCTRINE: a principle of international economy enunciated by leading statesmen of the Latin-American republics, to the effect that the non-payment of debt, or the non-performance of contract relations between citizens of different countries, does not justify armed

intervention. The present attitude of the South American nations in the matter of debt-collection by foreign governments is outlined in the opinions of the late Senor Calvo, who represented the interests of the Argentine Republic at Washington for more than half a century, and of Senor Drago, Minister of Foreign Affairs for the same country. Both of these gentlemen have written voluminously on the subject, and they are regarded as the best authorities concerning Latin-American opinion in this connection. So well known have their views become, and so widely have their opinions been discussed, that the 'Drago Doctrine' and the 'Calvo Doctrine' have become almost synonymous terms, and yet they are not identical. Senor Calvo expresses his views briefly in the following extract from his work on the *Theory and Practice of International Law*, written many years ago: 'In strict international law, the recovery of debts and the prosecution of private claims do not justify *de plano* (by immediate action) the armed intervention of governments; and as the states of Europe invariably follow this rule in their reciprocal relations, there is no reason why it should not be binding on them also in their relations with the nations of the New World.' The Drago attitude, published in 1892, is even more explicit, as expressed in these words: 'A public debt cannot justify armed intervention, and still less the occupation of the territories of the American nations by a European power. Such a situation would be evidently antagonistic to the principles proclaimed by the American peoples and particularly by the Monroe Doctrine.' To this Senor Drago added the following, in an official communication to the United States Government with reference to the claims of Great Britain, Germany, and Italy: 'In making a loan to a foreign state a capitalist always takes into consideration the resources of the country and the probability, greater or less, that the obligations contracted will be fulfilled without delay, and makes his terms more or less onerous accordingly.' Continuing the subject he declared that the lender, when advancing money to a republic, knows that he is dealing with a sovereign state, which is protected by its sovereignty against any outside judgment and collection. He admitted, of course, that the debts of a state should be paid, but the manner and time of the payment should be left to the authorities of the state. He proposed, therefore, that the United States should adopt the principle that 'public debt cannot occasion armed intervention, nor, still less, the actual occupation of the territory of American nations by a foreign power.'

In the final summing up of the matter Senor Calvo declared: 'It is certain that strangers who establish themselves in a country have the same right to pro-

tection as the nationals, but they ought not to pretend to a protection more extended. If they suffer any wrong, they ought to count on the government of the country pursuing the delinquents, and ought not to claim from the state to which the authors of the violence belong, any pecuniary indemnity.'

In the recent Pan-American Congress at Rio Janeiro, this subject was fully discussed, and referred unanimously to the Hague Tribunal for consideration.

CALVO, *kâl'vō*, CARLOS, Argentine jurist and author: b. Buenos Ayres, 1824, Feb. 26; d. Paris, 1893, May 4. In 1860, June 25, he was accredited to the courts of Paris and London as minister plenipotentiary, and resigned after having fulfilled his special mission. In 1885 he became Argentine minister at Berlin. In 1869 he was elected a corresponding member of the Paris Academy of Moral and Political Sciences, and later received the decoration of an officer of the Legion of Honor. He wrote numerous works, mostly in French, the most important of which are: *Complete Collection of Treaties, Conventions, and Other Diplomatic Acts of All the Latin-American States* (II vols., 1862–9); *Historical Annals of the Revolution in Latin America* (15 vols. 1864, and later dates); *International Law in Theory and Practice* (2 vols. 1870–2; 3d ed. 5 vols. 1881–8,) a work considered by jurists as one of the most remarkable on its subject; *Study on Emigration and Colonization* (1875); *Dictionary of Public and Private International Law* (2 vols. 1885); *Manual of Public and Private International Law* (3d ed. 1892.)

CALVUS, GAIUS LICINIUS MACER, Roman orator and poet, a son of the annalist and orator of the same name: b. 82 B.C.; d. about 47. He left 21 orations, but few fragments survive. One of these, against Vatinus, whose counsel Cicero was, produced so powerful an effect that the accused interrupted the orator and exclaimed, 'Judges, am I to be condemned because my accuser is eloquent?' His poems were ranked with those of Catullus.

CALX, n. *kălks*, plu. CALXES, *kălk'sĕz*, or CALCES, *kăl'sēz* [L. *ca'x* or *calcem*, limestone]: lime or chalk; the ashes or residuum left after burning a metal or mineral. As quicklime is produced by burning limestone, the alchemists applied the term C. to the products obtained by burning any ore or other mineral substance; and *calcination* (q.v.) to the process.

CALYCANTHUS, *kăl-ī-kăn'thŭs* [Gr. calyx-flower]: genus of plants of the nat. ord. *Calycanthaceoe*, an order allied to *Rosaceæ*, and of which only a few species are known, natives of N. America and Japan—shrubs, with square stems of remarkable structure, having around the central woody axis four smaller imperfect ones. An aromatic fragrance characterizes this order. In the genus C., the bark and leaves possess it as well as the flowers. The bark of *C. floridus*, a native of Carolina, has been used

as a spice and carminative, and his acquired the name of Carolina Allspice, or American Allspice. The flowers are of a chocolate color.

CALYCIFLORAL, a. *kă-lĭs′ĭ-flō′ral* [L. *calyx*, a flower-cup; *florālis*, floral]: in bot., applied to those plants where the petals and stamens seem to be inserted on the expanded calyx tube, as in the rose.

CALYCOID, a. *kal′ī-koyd* [Gr. *kalux*, a flower-cup; *eidos*, resemblance]: calyx-like.

CALYDON, *kăl′e-dŭn*, an ancient city of Ætolia, celebrated in the stories of King Œneus, the Calydonian boar, and Dejanira and Hercules.

CALYDON, Forest of, a large forest mentioned in the Arthurian legends; it is supposed to have been in the northern part of England, or it may have been the wooded portion of the midland counties, which include also the 'Sherwood' of Robin Hood.

CALYDONIAN BOAR, *kăl-e dō′nĭ-an bōr:* famed in Greek myth., according to which, a certain Œneus, King of Calydon, ancient capital of Ætolia (on the river Evenus, abt. seven m. from the sea) omitted a sacrifice to Diana, whereupon the goddess, in her rage, sent into his fields a frightful boar, which committed great devastation. No one had the courage to hunt it except Meleager, the son of Œneus, who, calling to his help the bravest heroes of Greece—Theseus, Jason, Nestor, and others—pursued and slew the monster. Later writers, however, affirm that he found it impossible to destroy the animal, until Atalanta, his mistress, aided him by piercing it with an arrow.

CALYMENE, *kăl′e-mēn*, a genus belonging to the fossil order of the trilobites, characteristic of the Upper Silurian formations of Europe. In this genus the head is almost semicircular, and deeply divided by longitudinal furrows. The eyes are situated on the lateral lobes. The rings of the thorax and abdomen are difficult to distinguish from each other. The thoracic segments are from 10 to 14 in number. The abdominal rings are distinct and never attached to each other. The genus includes about 20 species, of which the *Calymene Blumenbachii* may be taken as the type. The members of this genus have the power of rolling themselves up like a ball.

CALYPSO, *kalĭp′so*, in Grecian Legend: according to Homer, the daughter of Atlas inhabited the solitary wooded isle of Ogygia, far apart from all gods and men. Ulysses being thrown upon her island by shipwreck, she treated him kindly, and promised him immortality if he would marry her. He was fascinated by her charms, but unwilling to desert his wife and his native land; she detained him, however, seven years, and bore him two sons. On his departure she died of grief.

CALYPTRA, the hood of the theca or capsule of

mosses. The same name is given to any hoodlike body connected with the organs of fructification in flowering plants.

CALYPTRÆA, *kă-lĭp-trē′a* [Gr. *kalyptra* a headdress]: genus of gasteropodous mollusks, of the order *Pectinibranchiata*, type of a family, *Calyptraeidae*, formerly included in the genus *Patella*, or Limpet, when the mere form of the shell was more regarded in classification than the structure of the animal, and still known as Chambered Limpets, Cup-and-Saucer Limpets, Bonnet Limpets, and Slipper Limpets. The shell is limpet-shaped, but the apex is more of less spiral, and has a calcareous process from its inner surface for the attachment of a principal muscle. The *Calyptraeidae* differ much in shape, some being flat, some conical; some elongated.

CALYX, n. *kā′lĭks*, plu. Calyxes, *kā′lĭk-sĕz*, or Calyces, *kăl′ĕ-sēz* [L. *calyx*, a case or covering—from Gr. *kalux*, the cup of a flower]: in *bot.*, the outer enevelope or whorl of the leaf-organs of a flower. Calycine, a. *kăl′ĭ-sĭn*, or Calycinal, a. *kă-lis′ĭ-năl*, of or relating to a calyx; of the nature or appearance of a calyx. Calycle, *kăl′ĭ-kl*, or Calyculus, n. *kă-lĭk′ū-lŭs*, a row of leaflets at the base of the calyx on the outside; an epicalyx. Calycled, a. *kăl′ĭ-kld*, or Calyculate, n. *kă-lĭk′ū-lăt*, having the appearance as if possessing a double calyx.

CALYX, *kā-lĭks*, in Botany: outermost of the circles of modified leaves which surround the parts of fructification, and with them constitute the flower. Within the Calyx there is generally at least a second circle of leaves, called the corolla (see Corolla: Flower); but this is sometimes lacking, and the Calyx is the only envelope of the parts of fructification. The leaves of which the Calyx is composed are called sepals, when quite separate from each other; but they often grow together into a tube at the base, and the Calyx is then said to be *monosepalous* or *gamosepalous* [*monos*, one; *gamos*, union]. The sepals are generally simple and without stalks; they are generally green, and differ much less widely from ordinary leaves than the petals or leaves of the corolla; sometimes, however, they are *petaloid*, and brightly colored, as in *Fuchssia*. The Calyx and corolla of many endogenous plants resemble one another almost completely, and the common term *perianth* (q.v.) is then very generally employed. In some plants, the Calyx passes insensibly into the corolla and it is not easy to distinguish the innermost sepals from the outermost petals, as in the *Cactaceæ*. The Calyx is in such cases often composed of more circles of leaves than one. The Calyx occasionally falls off when flowering is over (*deciduous*), as in *Ranunculus;* sometimes even when flowering commences (caducous) as in the poppy; generally it remains till the fruit is ripe (persistent) and is then much enlarged and more brightly colored, as in

Physalis. The glumes (q. v.) of grasses, etc., used to to be regarded as a Calyx, to which, however, they have no proper analogy.

CAM, n. *kăm* [Dan. *kam*, a ridge, a comb: Ger. *kamm*, the cog of a wheel: comp. W. and Gael. *cam*, crooked, bent]: in *mech.*, a curved plate or groove, or a projecting part of a wheel or other moving piece, intended to produce and regulate an alternate or variable motion: ADJ. in *OE.*, crooked.

CAM, n. *kăm* [W. *cam*, crooked]: crooked river of England, which, rising in Essex, flows n.e. through Cambridgeshire, and after a course of about 40 miles, joins the Ouse 3½ miles above Ely. It gives its name to the town of Cambridge, which stands upon it, and below which it is navigable. It is familiar as the race-course for the boats of Cambridge students. Its ancient name was GRANTA.—*Cam* is a prefix in many names of places denoting situation on or near the bend or crook of a river.

CAMAIEU, or CAMAYEU, n. *kă-mā′yū* [F.—from It. *cameo*]: a stone graved in relief a painting in a single color, called also MONOCHROME. The ancients painted thus both in gray (*en grisaille*) and in red. Pictures of several tints, but where the natural colors of the objects are not copied, are said to be *en camaieu.* As one color generally prevails, we speak of blue, red, yellow, green camaieu. Polidori Caravaggio, for instance, so overlaid his other colors with brown, that his works give the impression of monochrome paintings. Drawings in Indian ink, red and black chalk, pencil, etc., as well as engravings, may be said to be *en camaieu.*

CAMALDOLITES, *ka-măl′dŏ-līts:* a religious order founded 1018 in the vale of Camaldoli, near Arezzo, in the Apennines, by St. Romuald, a Benedictine monk and a member of the family of the dukes of Ravenna. From Italy it spread into France, Germany, and Poland. The brethren, who wear a white garment, are, and have always been, characterized by the excessive rigidity of their monastic rule, showing to what lengths in a cruel mortification of natural life man can proceed. The order is now almost extinct.

CAMARGUE: see BOUCHES DU RHONE.

CAMARILLA, n. *kăm′ă-rĭl′ă* [Sp., a private room, especially one where boys are flogged]: in *Spain,* the confidants or irresponsible advisers of the sovereign. As *camara* (chamber) is used to designate, *par excellence,* the chamber of the king of Spain, the royal chamber, so Camarilla was also used to designate his private chamber or cabinet, the place where he received his most intimate friends, courtiers, sycophants, and all the moral refuse that naturally gathers round a weak throne. Hence in the political language of modern Europe, it has come to signify the influence exercised on the state by secret and unaccredited councilors, in opposition to the opinions of the legitimate ministry, an influence which in Spain

particularly has been found most pernicious. The word first obtained this meaning in the time of Ferdinand VII.

CAMBACERES, *kŏng-bâ-sa-rès'*, Jean Jacqués Régis, Duke of Parma, High Chancellor of the French Empire, under Napoleon: 1753, Oct. 18—1824, Mar. 5; b. Montpellier. In 1791, he was appointed pres. of the criminal court in his native place. Afterward, as member of the national convention, he was prominent in sketching the new code of laws, and distinguished himself by moderation. He denied the right of the convention to condemn the king, and, when this was done, argued in favor of a reprieve. After the revolution of the 9th Thermidor (1794, July 27), Cambaceres was elected pres. of the convention and as head of the committee of public safety, was active in procuring peace with Prussia and Spain. His enemies having succeeded in expelling him from office, he engaged himself in legal studies, and laid before the Council of Five Hundred the sketch of a civil code which afterward formed the basis of the *Code Napoleon*. In 1796, Cambaceres was for a short time pres. of this council. After the changes made in the directory, he was made minister of justice, assisted in the revolution of the 18th Brumaire (1799, Nov. 9), was made second consul, and faithfully attached himself to the interest of Napoleon, by whom he was raised to the office of high chancellor of the empire, and in 1808, was made Duke of Parma He in vain endeavored to dissuade Napoleon from the projected invasion of Russia. In 1813, when Napoleon took the field against the allies Cambaceres was left as pres. of the regency, and in this capacity accompanied the empress to Blois, 1814 From this place he sent to Paris his vote for the abdication of Napoleon During the Hundred Days, against his own will, he was made minister of justice, and pres. of the chamber of peers. After the second restoration, Cambaceres lived privately in Paris for some time; but in 1816, was exiled for having taken part in the execution of the decree for the death of Louis XVI. In 1818, his civil and political rights were restored, and he returned to Paris, where he lived in retirement till his death Among the men of the Revolution Cambaceres was one of the few whose activity was peaceable and truly progressive. His services in the establishment of law were great. His nature was mild and candid, and his intellect very acute.

CAMBA'LUC: see Peking.

CAMBAY, *kăm-bā':* feudatory or native Indian state in Hindustan; 350 sq. m.; of which the city of Cambay is the capital. It is within the political agency of Kaira, in the province of Guzerat, Bombay; and is governed by a nawab of his own who is a Mughal Mohammedan. Pop. 89,772.

CAMBAY: city of Hindustan, at the head of the Gulf of Cambay, on the right bank of the Myhee; lat. 22° 18′ n., long. 72° 39′ e.; 76 m. n.n.w. of Surat. Formerly it

was much more populous than now; ruinous palaces, mosques, and tombs, and an excavated temple of considerable pretensions, attest its past magnificence and extent. The main cause of its decay has been the gradual obstruction of its seaward navigation. It still exports grain, cotton, and ivory, besides its renowned manufactures in bloodstone and carnelian. Pop. 33,700.

CAMBAY, Gulf of: large inlet, at the n.w. extremity of the peninsula of Hindustan, 80 m. in length, averging 25 in breath. In proportion to its size, it receives a vast quantity of fresh water—on the w. the Gooma, Oolowtee, Gelya, and Setroonjee; on the n. the Saburmuttee and Myhee; on the e. the Nerbudda and the Taptee. The inundations of so many rivers, and the ebb and flow of tides, which fall and rise 30 ft. combine to elevate the bottom, and to produce movable quicksands.

CAMBER, n. *kăm'bėr* [F. *cambrer*, to bow, to crook—from L. *camĕrārĕ*, to arch over: Sp. *combar*, to bend: Gr. *kampto*, I bend]: a beam of wood slightly arched upon the upper surface; small dock in a dock-yard for containing boats, and for loading and unloading timber. Cam'bering, a. bending—applied to the deck of a ship as slightly higher in the middle than at the ends. Cam'bered, a. *-bėrd*, arched.

CAMBERT, *kŏng-bär'*, Robert; 1628—abt. 1677; b. Paris: earliest composer of French operas. He studied under Chambounieres, was organist of the church of St. Honoré, Paris, and musical superintendent to Queen Anne of Austria, mother of Louis XIV. While his patron, Cardinal Mazarin, lived, Cambert's works were performed before the French court. Falling into neglect at home, he went to London, and was appointed bandmaster to Charles II. His opera *Pomone* was produced in London, but did not succeed. His principal works were *Ariadne* and *Les Peines et les Plaisirs de l'Amour*. He died in London.

CAMBERWELL, *kăm'bėr-wĕl:* formerly a rural village, now a suburb of London, on the s. side of the Thames.

CAMBERWELL BEAUTY (*Vanessa Antiopa*): one of the largest and most beautiful British butterflies,common in the central and s. parts of Europe. The wings are of a deep brown color, with a band of black around the brown, and an outer band or margin of pale yellow, the black band containing a row of large blue spots, the yellow margin dappled with black specks, all the colors rich and velvety. The margin of the wings exhibits tooth-like angularities. The antennæ are terminated by a knob. The caterpillar feeds on the willow. It is black, with white dots and a row of large red spots down the back, and is rough with soft spines.—When Camberwell, now a London suburb, was more rural, and abounded in willows, this butterfly was sometimes taken there.

CAMBIASO, *kâm-bē-â sō*, Luca (called Luchetto da Genova), Italian painter: b. Moneglia, 1527; d. Madrid, 1585. His best works are the *Martyrdom of St. George;* and the *Rape of the Sabines.* Late in life, at the invitation of Philip II., he visited Madrid, and executed a fine composition, representing the *Assemblage of the Blessed,* on the ceiling of the Escurial.

CAMBIER, *kân-bē-ā*, Ernest, Belgian explorer: b. Ath, 1844. He entered the army, serving as adjutant on the general's staff, and in 1877 went as geographer on the first expedition of the International African Association, under the leadership of Crespel. The latter died in Zanzibar in 1878, and Cambier became leader. Accompanied by Wauters and Dutrieux, he started for the interior from Bagamoyo, and after a difficult journey reached Unyamwezi; after the death of Wauters and Dutrieux's return to Europe, he went on to Karema on Lake Tanganyika. Here, in 1879 September, he established the first post and scientific station of the association, and remained there till 1882. He published *Rapports sur les Marches de la première Expédition de l'Association internationale.*

CAMBIST, n. *kăm'bĭst* [F. *cambiste;* It. and Sp. *cambista,* a money-changer]: banker or money-changer; one skilled in the science of exchange. Cambist is also used figuratively as the title of a book in which the moneys, weights, measures, etc., of various nations are given in the equivalents of some particular one. Cam'bistry, n. *trĭ*, the science of exchanges, weights, etc. Cam'bial, a. *-bĭ-ăl*, pertaining to.

CAMBIUM, n. *kăm'bĭ-ŭm* [L. *cambio,* to change]: in *bot.,* a layer of mucilaginous, viscid matter, particularly abundant in spring, interposed between the woody layers and the bark of trees and other stems. Delicate cells (*Cambium cells*) are formed in it, which certainly fulfil important functions in the formation of new wood, though, notwithstanding much investigation by some of the greatest vegetable physiologists, the nature of these functions is still imperfectly known. The medullary rays are connected with the C. cells, and these cells gradually elongate into the shape which belongs to those of woody tissue. The C. layer is found only in exogenous stems.

CAMBODIA, *kăm-bō'de-a,* or Camboja, *kam-bō'ja* (native name *Kan-pou-chi*): extensive country of the Indo-Chinese Peninsula, now a protectorate of France bounded on the s.w. by the Gulf of Siam, on the s.e. by French Cochin-China, and on the n. by Siam; about 39,000 sq. m. See Cochin-China. The surface is mostly flat, and the soil fertile. There are extensive forests, which shelter elephants and deer; there are also wild-cattle and ponies, and the rhinoceros abounds. Among the chief products are rice, betel, areca-nuts, gamboge, spices, sandal-wood, and ivory. Iron occurs. Pop. 1,500,000.

CAMBODIA, or Mekong, a large river of southeastern Asia, which rises in Tibet, passes through Yunnan, a province of China, Laos, Anam, Cambodia, and French Cochin-China, and falls into the Chinese Sea by several mouths, after a course of about 2,600 miles. Its navigation is much interrupted by sand-banks, rapids, etc., at various points of its middle and upper course. The Tonle-Sap ('Great Lake'), on the frontiers of Cambodia and Siam, is connected with the Mekong.

CAMBON, Jules Martin, *zhûl mâr-tăn kân bŭn*, French diplomatist: b. Paris, 1845, April 5. He studied for the law and fought in the Franco-Prussian war, reaching the grade of captain. Entering the civil service, he became prefect of Constantine in 1878, prefect of the Department du Nord in 1882, prefect of the Rhone in 1887, governor-general of Algeria in 1891, and ambassador to the United States in 1897. He represented Spain in drawing up the Spanish-American protocol in 1898. In 1902 he became ambassador to Spain.

CAMBON, Pierre Joseph, French statesman; b. Montpellier, 1754, June 17, d. Brussels, 1820, Feb. 15. He was sent to the legislative assembly, and while supporting the cause of democracy, gave particular attention to financial matters; and to him the honor is due of having laid the foundation of the modern financial system of France. He promoted the confiscation of the estates of the *émigrés* in 1792, and voted for the death of Louis XVI. He became a member of the convention and at its opening was appointed member of the Committee on Finances; 1793, April 7, he entered the Committee of Public Safety. On June 2, when the Girondists were threatened by the infuriated mob calling for their proscription, he boldly took his place among them, hoping to be able, through his name of the Committee on Public Safety, to save them from violence and arrest. The next year he made another report on the administration of finances, which is considered a masterpiece of financial ability, and gives a full sketch of the plan which was afterward adopted for the regular registration of public debt. In the conflict which brought on the revolution of the 9th Themidor, Cambon took part against Robespierre and his adherents; but was charged with having been their accomplice, and a warrant was issued against him but he escaped. In 1815 he was elected a member of the Chamber of Deputies. On the second return of the Bourbons, he was exiled as a regicide.

CAMBON, Pierre Paul, French diplomatist: b. Paris 1843, Jan. 20. He was graduated at the École Polytechnique in 1863, and, after serving as secretary to Jules Ferry, became secretary of prefecture for the Alpes-Maritimes, prefect of the Aube, and French resident-general in Tunis. He was appointed ambassador to Spain in 1886, was transferred to Constantinople in 1890, and to London in 1898.

CAMBRAI, *kam-brā′*, Fr. *kong-brā′:* city of France, dept. of the Nord, about 32 m. s.s.e. of Lille. It is on the right bank of the Scheldt, strongly fortified and well-built, with wide, but irregular streets, and many picturesque old houses. The cathedral, archiepiscopal palace, town-house, and theatre are among the principal public buildings. The city was greatly injured in 1793, when the revolutionists, among other vandalisms, razed the fine cathedral. They also disentombed the remains of Fénelon, who was archbishop here, and melted his lead coffin into bullets. A monument, however, by David the sculptor was erected (1825) in the new cathedral, in memory of the immortal author of *Télémaque.* The manufactures are important, consisting of cambric—so called from its manufacture here—linen-thread, lace, cotton-yarn, beet-root sugar, soap, starch, leather, etc. It has also a trade in agricultural produce.

Cambrai was known to the Romans under the name of *Camaracum,* and was one of the chief cities of the Nervii. It was fortified by Charlemagne, and was long governed by its own bishops, to whom Charles the Bald ceded it. The celebrated league against the republic of Venice, which comprised the pope, the emperor of Germany, and the kings of France and Spain, was formed here 1508, and takes its name from the city. Here also were concluded treaties between the French king and the German emperor 1529, and in 1724–5 between Charles VI. and Philip V. of Spain. During 1815–18 it was the head-quarters of the British army of occupation. Pop. 25,250.

CAMBRIA, *kăm′brĭ-a:* ancient name of Wales, the Britannia Secunda of the Romans; derived from that of Cimbri or Cymri, by which the Welsh have always called themselves. See BRETTS AND SCOTS.

CAMBRIAN, a. *kăm′brĭ-ăn* [*Cambria,* anc. name of Wales]: in *geol.,* a term used to designate the lowest fossiliferous rocks as developed in Wales, and their equivalents in other countries; pertaining to Wales: N. a native or inhabitant of Wales. See PALEONTOLOGY.

CAMBRIAN SYSTEM, *kam′bri-an*: in Geology, includes the earliest fossiliferous formations. These abound greatly in n. Wales, where they were first studied, and were named from Cambria, the ancient name of Wales. The extent and limits of this system have not yet been definitely settled. At first it was regarded as lying immediately inferior to the Silurian measures, but later classification inclines to include them as part of the latter, and limit the term Cambrian to an extensive series of slates, grit-stones and sandstones, underlying beds of Silurian Lingula. In Anglesea these rocks have been metamorphosed into chlorite or mica schists, or into gneiss, in which, of course, there is found no trace of organisms. In n. Wales they are less altered, yet without fossils. In the Longmynd it reaches a thickness of 26,000 feet, unless some allowances

should be made for overlapping. A few fossils have been observed in this part of the system. Similar rocks occur in Ireland, in which have been found two species of a small branched zoophyte, Oldhamia by name, and numerous tracks and burrows of sea-worms.

In the United States, palæozoic rock forms the surface of the greater portion of the country from the Atlantic coast to the Rocky Mountains. This rock is usually fossiliferous, in some parts to a wonderful degree; many feet of the limestone appearing to be made up entirely of fossils. Prof. Dawson treats the Cambrian as a division of the Silurian series, dividing it into Upper and Lower Silurian. Others speak of it as a distinct system, and divide it into Upper, Middle and Lower Cambrian. These different authorities, however, agree in designating the Trenton group of limestones with the Utica slates and the shales and sandstones of the Hudson river group, as the most pronounced representative of the system in the United States. The Lower and Middle Cambrian of Prof. Hunt are seen in the Potsdam sandstone of New York, the Middle and Upper are found in the same state, and strata of the Lower extend from New Brunswick and Newfoundland into eastern Massachusetts. Cambrian beds in Europe diminish in thickness from w. to e. the series in England and Wales being 20,000 ft. in depth, in Russia not more than 1,000, and a little further disappearing. In America the diminution is in the opposite direction. Prof. Hunt estimates the thickness of the entire palæozoic series at 40,000 ft. in Pennsylvania and 4,000 ft. in the Mississippi valley. This system is one of foremost interest because of its great bulk, its wide diffusion, and the presence in the rock of unusually large limestones, and a singular variety of marine fauna. Barrande found a remarkable uniformity in the organic remains of those parts of the system which he investigated, extending through Europe and America and named by him the primordial zone.

CAMBRIC, n. *kām'brĭk* [from *Cambrai*, in Flanders]. general term for the finest and thinnest linen fabrics Some of the finest cambrics of the present day are produced in Switzerland. Scotch Cambric is really a muslin, being made of cotton with the fibre very tightly twisted, to imitate real or linen cambric: a. pertaining to or made of.

CAMBRIDGE, Ill., the county-seat of Henry county, a village on the Rock Island and Peoria R.R., about 28 miles southeast of Rock Island. Surrounded by a productive agricultural district, it has a thriving domestic and export trade in farm produce, grain and cattle, etc. Pop. (1904) 2,000.

CAMBRIDGE, Md., a city and county-seat of Dorchester county, about 58 miles southeast of Baltimore on the Choptank River, and on the Seaford & Cambridge R.R. Cambridge was settled in 1684 and was incorporated as a city in 1900. It is governed by a mayor

who is elected every two years by the city council, which consists of five members, the mayor and four aldermen. The aldermen are chosen by the different wards in the city. Cambridge has important manufactures of underwear and lumber, and as the centre of a fertile agricultural district has an active trade in farm produce and live stock. The oyster canning industry is also carried on to a considerable extent. Pop. (1910) 6,407.

CAMBRIDGE, *kām'brĭj:* city in Massachusetts, at the s.e. extremity of Middlesex co., near the mouth of the Charles river, opposite to Boston, from the centre of which its central portion is about 3½ m. n.w. Pop. (1900) 91,886; fifth city in the state in this respect. Cambridge is of an irregular oblong shape, with a length of 5 m., n.w. and s.e., and a breadth averaging less than 2 m. Along the n.e. side lies Somerville; on the n.w. and w. the towns of Arlington, Belmont, and Watertown; on the s.w. across the river, the Brighton district of Boston. Cambridge is situated in the midst of a plain extending back from the Charles river, and has in general a level surface, the highest land being 77 ft. above sea-level. The soil is good and moist; it consists mostly of sand, gravel, and clay; in some sections there are extensive beds of clay, while in others clay underlies the sand and gravel. The underlying rock is supposed to be slate. The surrounding country is open, includes some large tracts of marsh, and has higher elevations than those of Cambridge. The immediate vicinity of the city is largely occupied by market gardens in which vegetables, etc., are raised for the Boston market. Fresh Pond, a picturesque lake of considerable size (175 acres), lies in the n.w. part of the city's area. The climate is virtually the same as that of Boston. The city was formerly divided into villages called Old Cambridge, Cambridgeport, East Cambridge and North Cambridge, names which are still used to designate certain districts. Here also is located the massive stone courthouse of Middlesex County. The number of commons, parks, and public squares is 16, but their combined area is only 17 acres. The largest, Cambridge Common, in Old Cambridge has an area of 8½ acres, and contains a soldiers' monument. The city has few public buildings of consequence. Among important buildings are those of Harvard University; Radcliffe College; Cambridge Hospital; Manual Training School; the Latin and High Schools; Public Library; and Middlesex County Courthouse. The number of churches is about 30, Congl., Bapt., Episc., Meth., Rom. Cath., Unit., and Univ. The most beautiful church edifice is St. John's Memorial Chapel, belonging to the Prot, Epis. Theol. School; Christ Church, near the common, is the most venerable for associations. There are no theatres in the city, as these are supplied by the near metropolis; for similar reasons the newspapers are not of the first importance. In the

central part of the city (Old Cambridge) most interest attaches to the buildings of Harvard Univ. (q.v.), the oldest, most famous, and in many respects the most important, institution of superior education in the United States. In the w. part are situated Cambridge cemetery, of 41 acres, and some 12 acres of Mt. Auburn cemetery, famous for its beauty; most of the area of the latter (125 acres) is in Watertown.

The assessed valuation of all taxable property (1902) was $98,139,885; net pub. debt $6,664,609.

The government is by mayor, aldermen, and common council. The total length of sewers was 110 m., built at the cost of $1,428,200. The water-works are owned by the city. The system of public schools is elaborate and efficient. Cambridge is one of the shire-towns of Middlesex co., the courts are held and the county offices situated in East Cambridge. In 1900 the amount of capital invested in manufactures in Cambridge was $26,662,751; the leading industries were the making of organs and pianos, slaughtering and meat-packing, making of bricks and tiles, of soap and candles, printing and publishing, and the manufacture of furniture. But Cambridge is less famed for its industries than for its university, which has long made Old Cambridge a centre of cultivation and refinement.

Cambridge was settled 1631, and was at first called 'the new town,' or New Town. The emigration to the Connecticut valley, 1636, took place thence. In its first years the town was extended over a very large area, even to the Merrimac river. The college was founded 1636; after the Rev. John Harvard's bequest to it, in 1638, the name of the town was changed to Cambridge in memory of the univ. at which most of the educated men of the colony had studied. A printing press, the first in the English colonies, was established here 1639, and was actively employed, and the '*Bay Psalm-Book* published by Stephen Day and printed in 1640, was the first book from this press. Cambridge has now extensive printing establishments, including the Riverside Press, the Athenæum Press, and the University Press. For historical and literary associations, Cambridge is one of the most famous cities in the United States. The venerable Washington elm, under which Washington took command of the American army, 1775, July 3, stands at the corner of Mason and Garden streets. 'Craigie House,' built by Col. John Vassall in 1759, was Washington's headquarters in 1775–6, and afterward became the home of the poet Henry W. Longfellow until his death. On Elm Avenue is 'Elmwood,' the birthplace and home of James Russell Lowell, who lived here 1819–91. A part of this place has been bought by public subscription, to be preserved as a public park. This city has been the home of such distinguished men as Oliver Wendell Holmes, William Henry Channing, Margaret Fuller Ossoli, Col. Thomas Wentworth Higginson, Louis Agassiz, John Fiske. and Charles Eliot

Norton. The fine city hall and land for a park was the gift of a former citizen, Frederick H. Rindge, who also presented the city with a public library, an institution now called the Rindge Manual Training School, and other benefactions which amounted to more than $1,000,000. About 1650 a bridge over the Charles was built. In 1761, Christ Church, the first Episcopal Church, was erected.

After the surrender at Saratoga a large part of Burgoyne's army was quartered at Cambridge. An immediate result of the revolution was the removal of many royalist families. In 1793, the West Boston bridge, a marvel for those days, was opened to travel; this gave development to Cambridgeport, as the building of Craigie's bridge, 1807, did to East Cambridge. A large commercial activity was expected, but this was prevented by the embargo and the war of 1812. A city charter was granted 1846. See Paige, *History of Cambridge;* Drake, *History of Middlesex County; King's Handbook of Cambridge.*

CAMBRIDGE, Ohio, city and county-seat of Guernsey county, on the Baltimore & O. and the Pennsylvania R.Rs., 55 miles north of Marietta. It is situated in a coal and iron region which has also deposits of pottery clay; and the industries are chiefly mining and manufactures connected with these resources. There is also natural gas used for heating. The city owns and operates its waterworks. The city has five banks, court-house, children's home, and Carnegie Library. It was settled in 1804 and was incorporated as a city in 1887. Pop. (1910) 11,327.

CAMBRIDGE, England, an inland county bounded on the north by the county of Lincoln; on the west by Northampton, Huntingdon, and Bedford; on the south by Hertfordshire and Essex; and on the east by Suffolk and Norfolk. A great part of the northern half of the county belongs to the fen district and is very flat; farther south it is undulating, and in the southeast some heights occur. The principal rivers are the Cam or Granta, and the Ouse, with the Nene in the north. An important portion of the county, including the Isle of Ely, belongs to the great artificially drained tract known as the Bedford Level (q.v.). About nine-tenths of the total acreage of the county is now productive, and a greater proportion of land is under corn crops than in any other county in the kingdom. Potatoes, turnips, and mangold are the chief green crops. The southern portion of the county abounds in dairy farms, celebrated for the production of excellent butter and cheese. Pop. (1901) 190,687.

CAMBRIDGE, England, a municipal and parliamentary borough, capital of Cambridgeshire, situated on the river Cam, 50 miles north of London. It is an ancient place, and was a Roman station. In 871 the Anglo-Saxon town was burned by the Danes, and again in 1010. A castle was erected here by William the Conqueror. Cambridge received some valuable privileges from Henry

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I. In the reign of Richard II., who held a parliament here, great disputes took place between the authorities of the town and university, which ended in the former losing many of their privileges, and the corporation was not fully restored until the reign of Henry VIII. In 1630 the plague raged here with great violence, so that the students were driven from the university. The greater part of Cambridge occupies a level area, encompassed by the colleges and their beautiful grounds and gardens on both sides of the Cam, which is crossed by nine bridges. Several of the streets are narrow and winding, but others are spacious and airy, and much improvement has taken place of late years. The town possesses a guildhall, fine county hospital, free library, and one or two interesting old churches, especially St. Benedict's, with a tower in the Saxon style of architecture, and the round church of the Holy Sepulchre. It is the university, however, that gives Cambridge its importance, and the colleges and university buildings comprise many fine specimens of architecture. We may specify King's College, with its splendid chapel in the Perpendicular style, Trinity College (the largest in the university), Queen's College, Jesus College, St. John's College and chapel, Gonville and Caius College; the Fitzwilliam Museum, university library, senate house, divinity school, the Pitt Press, etc. The parish church of Great St. Mary's serves as the university church, and there is a handsome Roman Catholic church. A post-graduate Presbyterian college was opened in 1899. There is also a grammar-school. Cambridge is the birthplace of Jeremy Taylor, and of Richard Cumberland, the dramatist. The town sends one member to Parliament. Pop. (1901) 38,393.

CAMBRIDGE, *kām'brĭj*, Ada, the pseudonym of Mrs. George Frederick Cross, English novelist: b. Saint Germains, Norfolk, England, 1844, Nov. 21. She was married in 1870 to Rev. G. F. Cross and went with him to Victoria in that year, since 1893 living near Melbourne. She is the author of *My Guardian* (1877); *In Two Years' Time* (1879); *A Mere Chance* (1882); *A Marked Man* (1891); *The Three Miss Kings* (1891); *Not All in Vain* (1892); *A Little Minx* (1893); *A Marriage Ceremony* (1894); *Fidelis* (1895); *A Humble Enterprise* (1896); *At Midnight* (1897); *Materfamilias* (1898); *Path and Goal* (1900); *The Devastators* (1901); *Thirty Years in Australia* (1903); *Sisters* (1904); etc. She has also written several notable poems.

CAMBRIDGE, Adolphus Frederick, Duke of: 1774, Feb. 25—1850, July 8; seventh son of King George III. of England. He entered the army about 1790; and was appointed gov. of Hanover in 1816, and viceroy of the kingdom in 1831. His son, George William Frederick Charles, b. 1819, Mar. 26, became field marshal 1862 and subsequently and till 1895 commander-in-chief of the British army; then retired under the scheme of army reform.

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CAMBRIDGE, UNIVERSITY OF: one of the two ancient institutions of the kind existing in England. Overlooking several fabulous accounts of its origin, its true history may be said to begin at the opening of the 12th c. When Alfred of Beverley was student here, 1129, there were as yet no public halls or hostels, but each one lived in his own hired lodging.

The first regular society of students was that of Peterhouse, founded 1257. About this time students began to live together in hostels, under the rule of a principal, at their own charges. These hostels were named after the saints to whom they were dedicated, the churches which they adjoined, or the persons who formerly built or possessed them. In the year 1280 there were as many as 34, and some of them contained from 20 to 40 masters of arts, and a proportionate number of younger students; but all these hostels decayed by degrees when endowed colleges began to appear. Trinity hostel which survived all the rest, continued to 1540. The hostels were the beginning of what may by called the *college system*, which distinguishes the sister-universities of Oxford and Cambridge from those of Edinburgh, London, and the continent. See UNIVERSITIES.

It was between the latter part of the 13th and the close of the 16th c. that nearly all these royal and religious foundations were endowed which now constitute the university. Hugh de Balsham was the first benefactor in this way. Michael House was founded by Hervey de Stanton, 1324, and King's Hall by Edward III. 1332, both of which were merged in Trinity College by Henry VIII, 1546. Clare Hall, as it used to be called, one of the earliest, and still in its buildings one of the most attractive colleges in Cambridge, was founded by the Countess of Clare, 1326. Henry VI. has left himself an imperishable monument in the splendid foundation of King's College; and his queen, Margaret, commenced the foundation of Queens' College, which was added to by Elizabeth Widville, queen of Edward IV. Lady Margaret, Countess of Richmond and Derby, mother of Henry VII., founded Christ's College and St. John's at the beginning of the 16th c., and also the divinity professorship named after her. Henry VIII. appropriated part of the spoils of the monasteries to the foundation of Trinity College, and Queen Mary augmented the endowment. The five regius professorships were endowed by Henry VIII. Cambridge was frequently visited by the plague, and university proceedings were suspended by it in 1642 and 1666. In 1643, Cromwell took possession of the town, and the most eminent loyalists were expelled from the university. Almost all the colleges had sent their plate to the king at Nottingham. As might be expected, little was done for the university in this troubled century; indeed no new colleges were added until the founding of Downing College in 1800.

The predominance of the religious element in the college discipline is to be attributed as much to the circumstances and manners of the times in which the colleges were found-

ed, as to the piety of the founders. There had been, from very early times, 'religious houses,' and these were in many cases united with the new collegiate foundations. There were, for example, the Dominicans, or preaching friars, whose house is now turned into Emmanuel College. The friars who lived in these convents were capable of degrees, and kept their 'acts,' or exercises for degrees, as other university men. There were, however, frequent quarrels between them and the other students. To the same cause is to be traced the condition of celibacy, upon which, with few exceptions, the fellowships were formerly tenable. These conditions had been considerably relaxed before the abolition of the restrictions as to marriage and (except in the case of offices with clerical functions) holy orders, which was proposed by the statutes issued in 1881 by the Cambridge commissioners under the Universities of Oxford and Cambridge Act (1877). These statutes are to take the place of those confirmed by the queen in council 1858.

The governing body of the university is the senate; but, before being submitted to it all university laws must be approved by the council—a body elected by the resident members of senate. After the chancellor and high-steward, the chief executive power is vested in the vice-chancellor, who is elected annually from among the heads of colleges. The public orator is the voice of the senate upon public occasions. The proctors superintend the discipline and morals of all persons *in statu pupillari;* they are present at all congregations of the senate, read the 'graces,' and take the votes. The registrary is responsible for the graces being offered in due form, and has charge of the university records. There are three terms in this university—the Michaelmas or October term, the Lent term, and the Easter term. To take an ordinary B.A. degree, a student must reside nine terms. The M.A. degree follows, without examination, about four years after. Dissenters are not now excluded from taking degrees, except in divinity.

With respect to the admission of students, their university course, expenses, and proceedings in degrees, the following information may be useful: There are four classes of students—viz., *Fellow Commoners* and *Noblemen, Pensioners, Sizars* and *Sub-sizars,* and the more distinguished students who are elected *Scholars* on the foundation of their college. The first class (now almost obsolete), are so called from their dining at the fellows' table; they wear silk or embroidered gowns, and pay heavier fees. The pensioners are the great body of the students, are not on the foundation, and pay for their own commons, viz., dinners in hall, etc., and for their rooms. The sizars are poorer students, selected, however, by examination, who receive free commons and certain money payments, are admitted at lower charges than the pensioners, but wear the same dress, and are no longer subject to the performance of menial offices as they formerly were. Some of the colleges, especially St. John's and Trinity, have very liber-

al endowments for the sizars, and considerable pecuniary assistance is given to the more deserving. The scholars are elected by examination, from the pensioners and sizars; they are on the foundation of the college, from which they receive certain emoluments. The fellows are subsequently elected from the scholars and the students who have distinguished themselves in the tripos examinations. Vacancies are, as a rule, filled up by members from the college, but fellowships are sometimes open to the competition of the whole university. The usual age of admission is 17–20 years. Before a student can be admitted, he must obtain from some master of arts of the university of Cambridge or Oxford a certificate of being qualified for admission; this certificate must be sent to the tutor of the college, with the caution-money, which, in the case of a pensioner, amounts to £15. At some colleges there is an entrance examination previous to matriculation, in place of the above certificate.

Residence is usually commenced in the October term. The undergraduate in his first year of residence is called a 'Freshman;' in his second year, a 'Junior Soph.;' in his third year, a 'Senior Soph.' The ordinary B.A., or bachelor of arts degree, may be taken in the ninth term of residence—viz., in the third June after coming up. The examinations required are: 1. The previous examination, or 'Little-go' (usually taken in the first or third term of residence), the subjects for which are a gospel in Greek, a Greek classic, a Latin classic, Greek and Latin grammar, Paley's *Evidences of Christianity;* Euclid i., ii., iii., vi.; arithmetic and elementary algebra. 2. The general examination in more advanced classics and mathematics. 3. A special examination in *one* of the following subjects: Theology, Logic, Political Economy, Law, Modern History, Chemistry, Botany, Zoology, Geology, Applied Science, Music. Candidates for honors have to pass certain additional mathematical subjects in their 'Little-go,' and then have no further examination till the tripos. Honors may be taken in any of the following triposes: Mathematics, Classics, Moral Sciences, Natural Sciences, Theology, Law, History, Semitic Languages, Indian Languages. The mathematical tripos has existed since 1747; the classical, since 1824; the others are more recent. Previous to 1850, candidates for classical honors must first have obtained a place in the mathemetical tripos. It was arranged that the following regulations for the triposes should come into effect 1882: The mathematical tripos is divided into three parts. The first two parts take place in the June at the close of the third year, or ninth term of residence, and the successful candidates will be arranged in three classes called wranglers, senior optimes, and junior optimes, the members of each class being also placed in order of merit. Only the wranglers may proceed to the third part of the examination in the following January. The subjects for this third part are divided into four groups, excellence in any one of which entitles to the highest honors. According to their success in this exam-

mation, the wranglers will be re arranged in three classes, the names in each class being, however, in alphabetical order. The classical tripos consists of two parts—the first in general classical scholarship, and taking place at the end either of the second or of the third year of residence; the other at the end either of the third or of the fourth year, and including, besides a further examination in pure classics obligatory on all candidates, a special knowledge of one or two, but not more than two, of the following subjects: ancient philosophy, history, archeology, philology. The successful candidates in each part will be arranged in three classes. In the first part, the examiners may indicate differences of merit within the classes by the use of brackets; in the second part, the names are to be given in alphabetical order. The natural and moral sciences triposes have also been divided into two parts, a general and a special. The mathematical and classical triposes are followed by examinations for the Smith's mathematical prizes and chancellor's classical medals, the result of which often differs from that of the triposes.

The university has 35 professors, increased to 40 by the statutes of 1881, in addition to readers, demonstrators, and assistants. Besides having the advantage of the instructions, and being under the discipline of the university, previous to 1869 all students, and since that time the great majority of their number, are in connection with one of the colleges, and subject to its regulations. The tutor of the college is understood to be *in loco parentis* to his pupils; the dean has the oversight of 'religion and morals;' and instruction is given by college lecturers.

The great prizes at the university are the *Fellowships*, of which there are about 400. Their value and conditions of tenure vary greatly at the different colleges; but, under the statutes of 1881, restrictions as to marriage and holy orders are done away with, the stipend (exclusive of certain allowances) limited in most colleges to £250 per annum, and the length of tenure to six years. The last regulation does not apply to fellows who at the same time occupy a university or college office. There are also stipends attached to the various college offices—those of dean, bursar, lecturer, etc. The office of tutor is one of great honor and emolument. There are various other university distinctions, both scholarships and prizes, for an account of which the *Cambridge Calendar* should be consulted.

The following is a list of the colleges in the order of their antiquity. A particular notice of each college will be found in its alphabetical place.

Name.	Founded.	Undergraduates in 1902.
St. Peter's College, or Peter House	1257	53
Clare College	1326	183
Pembroke College	1347	244
Gonville and Caius College	1348	236
Trinity Hall	1350	166
Corpus Christi, or Benedict College	1351	39
King's College	1441	138

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Name.	Founded.	Undergraduates in 1902.
Queen's College	1448	93
St. Catherine's College, or Hall	1473	61
Jesus College	1496	105
Christ's College	1505	170
St. John's College	1511	247
Magdalene College	1519	42
Trinity College	1546	664
Emmanuel College	1584	162
Sidney Sussex College	1598	79
Downing College	1800	51
Magdalene College	1876	42
Selwyn College	1882	75
Total		3,044

About half of these undergraduates have rooms in college; the others reside in lodgings, but under the same rules as to college discipline. Besides all such, there were (1902) 70 students unconnected with any college, making in all 3,114 undergraduate members of the university. Non-collegiate students were first admitted to the university, 1869, and are under a special board presided over by a censor, who acts as their tutor; 77 of their number are resident at Cavendish College, founded 1876 for the advantage of younger students, but not incorporated into the university. Selwyn College, in memory of Bishop Selwyn, was opened in 1882.

Few of the colleges present an imposing façade to the streets—King's is, perhaps, the only one which may be said to do so—but the quiet and picturesque beauty of the courts in the interiors is very pleasing. Other public buildings are the senate-house, where examinations are held, degrees conferred, and all public business of the university conducted. The Fitzwilliam Museum is the finest of the modern additions to the university. Viscount Fitzwilliam bequeathed (1816) £100,000 South-sea annuities, the interest of which was to build and support a museum. He left also a very valuable collection of books, paintings, etc., as a nucleus for future contributions. G. Basevi was the architect. The university library is a fine mass of buildings of different periods, and is said to contain about 500,000 vols. The geological museum contains the original collection of Dr. Woodward, which, out of respect to the founder, has been kept in its original state, unmixed with recent and vastly more numerous and interesting acquisitions. The university is indebted for many of these geological treasures to the late Professor Sedgwick. The mineralogical room contains the valuable collections of the late Sir A. Hume, Charles Brooke, and Henry Warburton. The Pitt Press is a gothic structure built in honor of Mr. Pitt, who was educated at Cambridge. It contains the university printing-offices, which are very extensive. There is also a good anatomical museum.

There is a very good hospital, founded 1753 under the will of Dr. Addenbrooke. The observatory contains some very fine instruments, among which is a large equatorial telescope, presented by the Duke of Northumberland 1835. The income (including trust-funds) of the university is about £33,000, which, by the statutes proposed by the commis-

sioners under the act of 1877, is to be largely added to by the colleges, whose aggregate income is about £300,000 per annum.

For the most recent information about the university studies, etc., the *Cambridge Calendar* for the current year should be consulted; see also the *Student's Guide to the University of Cambridge* (5th ed. 1880); for the history, biography, and antiquity, see Fuller's *History of Cambridge;* Dyer; Caius; Le Keux' *Memorials;* Cooper's *Annals* (1842); Cooper's *Athenæ Cantabrigienses; Graduati Cantabrigienses;* Cooper's *Memorials of Cambridge* (1860); Ackermann's *History of the University of Cambridge* (1815); Huber's *English Universities* (transl. F. W. Newman, 1843); H. Gunning's *Reminiscences of Cambridge from the Year* 1780 (2 vols. 1854); C. Wordsworth's *Social Life at the English Universities in the Eighteenth Century* (1874), and *Scholæ Academicæ* (1877); J. Bass Mullinger's *The University of Cambridge till* 1535 (1873). Girton (q.v.) and Newnham Colleges for ladies are at Cambridge.

CAMBRIDGE PLATFORM: summary statement of the Congregational system of church government, drawn up by a synod of the New England churches, Cambridge, Mass., 1648. In 1646, May, the general court or legislature of Massachusetts passed an order expressing a desire that the 'elders and messengers' of the churches of the colonies of Massachusetts Bay, Plymouth, Connecticut, and New Haven should meet in synod for this purpose at Cambridge in Sep. Meeting there, the synod appointed three members to draw up each a plan of a scriptural model of church government. After two adjournments the synod, 1648, Aug., reassembled and considered these plans, finally adopting in the main that prepared by the Rev. Richard Mather, of Dorchester. The platform has 17 chapters. The first four affirm that the word of God prescribes one immutable form of church government, and define the nature of the Catholic church in general, and of a particular visible church; the fifth assigns the source of church power, whether of the elders or of the brethren. The sixth and seventh chapters provide that the officers of each church shall be elders (including pastors, teachers, and ruling elders) and deacons. The pastor and teacher having divided charge of the duties ordinarily performed by ministers at present, the ruling elders were to join with them in such matters as admission of members, ordination of church officers, excommunications, the calling of church meetings, and general guiding of church business. These officers, it was provided by the eighth chapter, must be chosen by the individual church, which, however, might well advise with neighbor churches. The ninth chapter treats of ordination, to be performed by the elders of the church or, in default of any, by some of the brethren; the tenth discusses the respective powers of the presbytery (or officers of the church) and of the 'brotherhood.' The next five chapters refer to the maintenance of church officers, the admission of members, their transfer from one church to another, excommunications, and other censures; and the

intercommunion of churches by way of admonition one to another, or otherwise. Synods, consisting of elders and other church-members, to decide controversies respecting doctrine, but not to interfere in church-government, were provided for in the sixteenth chapter; and the last defined the duty of civil magistrates in matters concerning the churches, with whose freedom they were not to interfere. In 1649, the general court commended the platform to the consideration of the churches of Massachusetts, who approved it, whereupon it was indorsed by the court in 1651, was accepted as a helpful summary and guide, and long remained the standard of Congregational polity in New England. It was of authority, however, in only a general way, and as subordinate to Holy Scripture. As time passed, bringing new social developments and increasing experience, some of its points were modified in the practice of the churches; and this platform, though still revered in its general spirit, has long ceased to be a guide in details of Congl. church administration.—*H. M. Dexter, Congregationalism as seen in its Literature* (1880).

CAMBRIDGE PLATONISTS: the designation of a small but distinguished group of thinkers at Cambridge University, England, who in the 17th century endeavored to controvert the empirical and materialistic theories of Thomas Hobbes by means of an adaptation of the Platonic philosophy to modern conditions. Hobbes had held that all forms of human knowledge are derived ultimately from the senses; that the senses reveal to us only objects existent in space and time, and governed universally by causal laws; that these objects when intelligently construed are seen to be phenomena of matter in motion. Fully aware that for materialism there is no place logically for ethics or for religion, and aware also that to controvert fairly an opposing position they must understand it and give to such its proper setting, the Cambridge Platonists first attacked Hobbes' teaching that all knowledge can be derived from sensation. The most distinguished representative of the group—Cudworth—insisted that sensation in itself can tell us nothing; that in order to do so it must be related to other sensations and brought under general conceptions. Thus an awareness of objects involves a rational as well as a sensitive factor, and of the two the rational is the more fundamental and significant. Hence, matter and motion are themselves phenomenal, and rest for their explanation upon a reality which is itself rational and ideal. Hobbes' and Cudworth's philosophies are thus antithetic and equally one-sided as the later work of Kant showed clearly. A further though consequent error of Cudworth's was that he regarded abstract ideas as fixed and native forces of the soul, each of which is the imprint in the finite mind of an eternal type existent in the mind of a transcendent God.

CAMBRIDGESHIRE, *kām'brĭj-shĕr:* inland county of England; greatest length about 50 m., breadth 30 m.; area

820 sq. m. About three-fourths of the country consists of arable land, meadow, and pasture, the rest being fens. The surface of C., except in the s., which is somewhat elevated and on the chalk formations, is marshy and flat, thinly wooded, and with villages and churches here and there on slight elevations, called 'eys' or islands. The chief rivers are the Ouse, which crosses the middle of the county from w. to e., with its tributary, the Cam; the Nene, which borders the county on the n.; and the Lark. These all are navigable to some extent. Cambridge is an agricultural county. The manufactures of Cambridge are mostly such as belong to an agricultural county. There are paper and parchment mills; and coarse earthenware is manufactured. Needle-making is also carried on to some extent. Cambridge returns 3 members to parliament. This county was anciently the seat of a powerful tribe—the Iceni. In the 9th and 10th c., Cambridgeshire was the scene of severe contests between the Danes and Saxons. The Isle of Ely and its monks withstood William the Conqueror for 8 years. Cambridgeshire, and especially the Isle of Ely, suffered much in the civil wars of Stephen, John, Henry III, and Charles I. Pop. (1901) 185,128.

CAMBRONNE, *kŏng-bron'*, Pierre Jacques Étienne, Count: 1770–1842, Jan. 8.; b. St. Sébastien, near Nantes: French general. He served in the Vendean campaign under Hoche, in Ireland, under Masséna in Switzerland, and in all the campaigns of the empire. In 1806 he was made col. at Jena, distinguished himself in the retreat after the battle of Leipzig, and in 1814 accompanied Napoleon to Elba. In 1815 he was made lieut.gen. and peer of France, and at Waterloo commanded a division of the Old Guard; the famous reply, *La gardemeurt et ne se rend pas*, attributed to him, is an invention. Captured at Waterloo, on returning to Paris he was imprisoned by Louis XVIII., but soon released. Made marshal 1820, he retired 1824, returned to the army at the time of the revolution of 1830, but soon retired again, and died at Nantes.

CAMBYSES, *kăm-bī'sēz:* King of the Medes and Persians: son of Cyrus and Cassandane; succeeded his father in the monarchy, B.C. 529, d. B.C. 521. Cambyses is the Greek form of his name; the ancient Persian name is Kabujiya. In B.C. 525, Cambyses invaded Egypt, defeated Psammenitus, King of Egypt, at Pelusium, and in six months made himself master of the whole country. He meditated further conquests, but was not permitted to carry his designs into effect; the Tyrians, upon whom his maritime power depended, refused to serve him against the Carthaginians; an army which he sent to take possession of the temple of Jupiter Ammon perished in the desert; and one which he led in person against the Ethiopians was compelled to return from want of provisions. Cambyses now addicted himself to excessive intoxication, and perpetrated horrid cruelties in Egypt; the accounts of which,

however, depending upon his enemies, the Egyptian priests, are doubtless exaggerated. It is probable, however, that his tendency to epileptic fits, with the arbitrary disposition induced by success and power, caused him to indulge in violent and capricious acts of tyranny. The Egyptians believed him to be mad. A pretender to the Persian throne having appeared, Cambyses marched against him, but died on the way in Syria.

CAMDEN, *kăm'den:* village and township of Knox co., Me., on w. side of Penobscot bay, 8 m. n.n.e. of Rockland. It has a good harbor, ship-yards, lime-kilns, a car factory, and a weekly paper. Pop. 3,000.

CAMDEN: city and port of delivery; cap. of Camden co., N. J.; on the Delaware directly opposite Philadelphia, with which it is connected by five ferries, and of which it is now the most populous suburb. De Vries landed on its site 1633, Jan. 10. It was chartered as a city 1831; at that time it was composed of three separate villages, and engaged in raising vegetables and fruit for the Philadelphia market. The Camden and Amboy railroad connecting with New York, added to its importance; it became afterward the terminus of others leading to Cape May and Atlantic City. It is regularly laid out, with streets at right angles, and contains 40 churches and many good buildings. It has extensive iron-works at Kaighn's Point, several ship-yards, and many manufactories. The city is governed by a mayor and common council. The increase in pop. is rapid. Pop. (1910) 94,538.

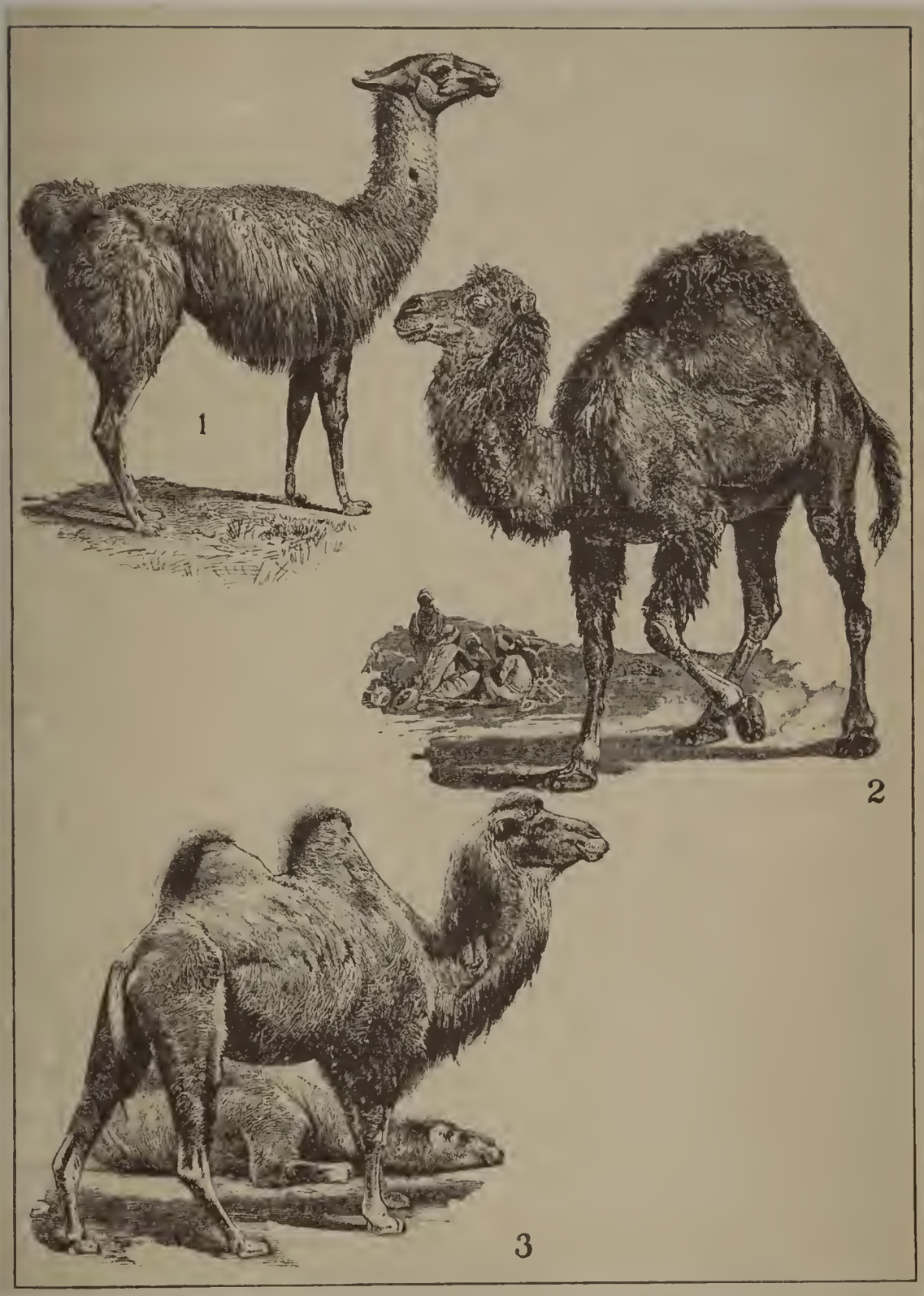
CAMDEN, Battles of: at Camden, S. C., 1780, Aug. 16, the American forces under Gen. Gates, 3,600 strong, chiefly militia, were totally defeated by Lord Cornwallis. This ended Gates's military career; he was removed from command and suspended from service pending an inquiry into his conduct. In this action Baron De Kalb, commanding the right wing, was mortally wounded. Congress erected a marble monument in his honor on the street which bears his name; Lafayette laid the corner-stone 1825. In 1781, April 25, Greene, who had succeeded Gates, was attacked and worsted by Lord Rawdon at Hobkirk's Hill, near Camden; 100 or more were killed on each side; the Americans lost 100 prisoners. In 1865, Feb. 24, Camden was taken by Gen. Sherman, after a lively skirmish. Two thousand bales of cotton and a quantity of tobacco were burned.

CAMDEN, Charles Pratt, Earl of: 1714–1794, Apr.; younger son of Sir John Pratt, chief justice of the court of king's bench in the reign of George I. Educated at Eton and Cambridge, he studied for the law, and was called to the bar 1738. Not until 1752, however, when he defended a bookseller successfully against a government prosecution for libel on the House of Commons, did Camden's prospects appear bright; from this time his success was certain. In 1757, he was appointed attorney-gen., and four years afterward accepted a seat on the bench in the

court of common pleas. Judge in the trial of Wilkes, he declared his opinion emphatically that the action of government in this case, by general warrants, was altogether illegal—an opinion which, chiming in with public sentiment at the time made him the most popular of judges. In 1765, he was created Baron Camden of Camden Place, Kent, by the Rockingham administration, to whose American policy, and to their treatment of Wilkes, notwithstanding, he offered constant opposition. The following year, when he was made lord chancellor, he did not abandon his principles; and four years afterward—the Duke of Grafton being then prime minister—he supported an amendment made by Chatham on the government address, and resigned his place. His judicial career ended here; henceforth, he was entirely a political character, and for more than 20 years was active against the ill-advised American policy pursued by Lord North, and in discussions on the law of libel, in which he maintained the popular view. As a judge, he is held in high estimation, though his manner was somewhat undignified. He filled the office of pres. of the council in the Rockingham administration 1782; also under Pitt from 1783 till his death.

CAMDEN, William: scholar, historian, and antiquary: 1551, May—1623; b. London, where his father was a paper-stainer. His education, commenced at Christ Hospital, was completed at St. Paul's School, and at Oxford. In 1575, he was appointed second master of Westminster School; and while in this office he undertook the work which made his name famous, his *Britannia*, an account of the British Isles from the earliest ages, in elegant Latin, published 1586. It at once brought him into communication with the learned men of his time. Before 1607, the work had passed throuh six editions, being greatly enlarged and improved by the indefatigable industry of the author. The book, at first a comparatively small single volume, has received much additional matter from other writers. The best-known edition of Camden's *Britannia* is that of Edmund Gibson, in English, 2 vols. fol. Of this great work of Camden, Bishop Nicolson said it was 'the common sun whereat our modern writers have all lighted their little torches.' In 1593, Camden was appointed head master of Westminster School; and four years later he was made Clarencieux king-at-arms, an appointment which gave him more time for the pursuit of his favorite studies. His other most important works are—*Annals of the Reign of Elizabeth; A Collection of Ancient English Historians; An Account of the Monuments and Inscriptions in Westminster Abbey;* and a *Narrative of the Gunpowder Plot.* He died at the age of 72, and was buried in Westminster Abbey. He endowed a professorship of history at Oxford. The 'Camden Society,' for the publication of early historical remains, is named in his honor.

CAME, v. *kām:* pt. of Come, which see.



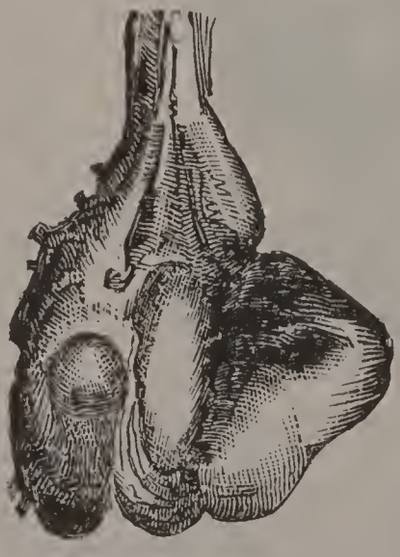
1. Guanaco 2. Dromedary. 3. Two-Humped Camel

CAMEL, *kăm'el* [CF. *cadmel* or *camel*—from L. *camēlus;* Gr. *kamēlos;* Ar. *gamal*], (*Camelus*): genus of quadrupeds of the order *Ruminantia,* of which only two species exist, both of great use to mankind. This genus is the type of the family *Camelidæ*, to which there belongs only one other genus, *Auchenia* (q.v.), including the llama, alpaca, etc. The whole number of species of *Camelidæ* is, therefore, very small, and they seem to belong originally to limited regions, both in the old world and in the new. To the peculiarities of these regions, they exhibit a wonderful completeness of adaptation. The family is regarded as forming a sort of link between the orders *Ruminantia* and *Pachydermata.* The dentition differs from that of all other ruminating animals, particularly in the presence of incisors or cutting-teeth in the upper jaw; camels having also canine teeth in both jaws, and the llama and its congeners in the lower jaw of both sexes; and differences equally important appear in the feet, which have not the cloven hoof common to all the rest of the order—two short toes with separate hoofs adapted to one another—but two elongated toes, each tipped with a small nail-like hoof, the feet resting not upon the hoofs, but upon elastic pads or cushions under the toes.—In the camels,

Bactrian Camel.

the toes are united by a common sole, thus resting upon one extended pad, instead of having each a separate one, as in the genus *Auchenia;* the broader expanse of the foot enabling the animals of the one genus more easily to traverse the loose sand of the desert, while the separation of the toes in the other is suited to the uneven surface of rocky heights. The camels are also distinguished by the females having four teats, while those of the other genus have only two; and by a hump or two humps upon the back, of which the llama and its congeners exhibit no trace. The long neck, small head, prominent eyes, and tumid and cleft upper lip, with considerable prehensile power, are common to both genera: but with much similarity of form, as well as of particular characters, the *Camelidæ* of the Andes exhibit a gracefulness of outline which strongly contrasts with the gaunt angularity of those of the eastern deserts. Camels are indeed animals of uncouth appear-

ance. Of the two species, that known as the Arabian C. (*C. Dromedarius*) has only one hump on the back, while the Bactrian C. (*C. Bactrianus*) has two. Some confusion has arisen from the occasional employment of the name dromedary (q.v.) as a designation of the former species; the name properly pertains to a particular variety of that species, more slender and graceful than the ordinary variety, and of much greater fleetness. Without the C. many a wide desert, now crossed by commercial lines, would be impassable by man. The hump on the C.'s back is a wonderful provision of nature, to adapt the animal to endure long abstinence from food, or to subsist on very scanty supplies; being, in fact, a store of fat, from which the animal draws as the wants of its system require; and the Arab is very careful to see that the hump is in good condition before the commencement of a journey. Sir Samuel Baker says a camel carrying a load of 400 lbs. requires water every third day, that is, every 90 m., but can in case of necessity do four days quite well. In cold weather it will work seven or eight days without drinking; when only grazing, some camels drink only once a fortnight. Beyond its limit the C. gets ill and dies. After it has been much exhausted, three or four months of repose and abundant food are necessary to restore it. The backbone of the C. is as straight as that of other quadrupeds.—Another very interesting adaptation to the desert is to be noticed in the thick sole which protects the feet of the C. from the burning sand, and in callosities of similar use on the chest and on the joints of the legs, upon which the C. rests when it lies down to repose, or kneels, as it does for various purposes, and is taught to do that it may be loaded, or that its rider may mount upon its back.—The wedge-shaped cutting-teeth of the lower jaw are also particularly fitted for browsing on shrubby plants, such as the desert produces —the camel's thorn, tamarisk, etc.. which form a large part of the food of the C.; the eyes are furnished with long eyelashes, to protect them from the glare and from the drifting sand; while the exclusion of the sand from the nostrils is also provided for by a power of closing their oblique openings at will. But most interesting of all is the provision made for the C.'s endurance of long drought, by the lining of the inside of the second stomach, or honey-comb bag, and of a portion of the first stomach or paunch, with great masses of cells, in which water is stored up and long retained. This store of water is well known to the Arabs, who, when sore pressed by thirst, sometimes avail themselves of it by killing some



Inside of a Camel's Foot: A, is the cushion on which the animal treads. shown as lifted out of its bed.

of the camels of the caravan.—The first stomach of the *Camelidæ* is divided into two compartments by a muscular band—one of the points of difference between them and the other ruminants. Muscular bands, proceeding from this principal one, and intersected by other muscular bands, nearly at right angles, form the cells for containing water. It may be added here, that the senses both of sight and smell are extremely acute in the C., and that it is capable of discerning water at a great distance.

The Arabian C. carries twice the load of a mule. The Bactrian C. is sometimes loaded with 1,000 or even 1,500 lbs. weight, though not generally with so much. The East India Company had at one time a corps of camels, each mounted by two men armed with musketoons. The use of the C. for the conveyance of travellers and merchandise has won it the name of the *ship of the desert*. A caravan sometimes contains 1,000, sometimes even 4,000 or 5,000 camels. The supply of food carried with the caravan for the use of the camels is very scanty: a few beans, dates, carob-pods, or the like, are all that they receive after a long day's march, when there is no herbage on which they may browse. The pace of the loaded C. is steady and uniform, but slow; it proceeds, however, from day to day, accomplishing journeys of hundreds of miles at a rate of about $2\frac{1}{2}$ m. per hour. Some of the slight dromedaries, however, can carry a rider more than 100 m. in a day. The motion of the C. is peculiar, jolting the rider in a manner extremely disagreable to those unaccustomed to it; both the feet on the same side being successively raised, so that one side is thrown forward, and then the other.

The C. produces only one young one at a time, or rarely two. It lives 30 or 40 years.

The patience of the C. has been celebrated by some authors; and the cries by which it expresses its sense of injury when a heavy load is placed upon its back have been pathetically described. With all its general submissiveness, however, the C. is resentful of injury, and during the rutting season it becomes particularly vicious.

The flesh and the milk of the C. are much valued by the Arabs as articles of food. The dung is used for fuel, and it was from the soot of this dung that the sal-ammoniac formerly imported from Egypt was obtained by sublimation, while the sources from which that substance is now procured were unknown. The hair is used for the manufacture of cloth, some kinds of which are coarse, others comparatively soft and fine. C.'s hair is also imported into Europe for the manufacture of the pencils or small brushes used by painters. The C. can now scarcely be said to exist anywhere in a wild state. It has lately been introduced into Australia.

A fossil species of C. (*C. Sivalensis*), larger than either of the existing species, has been discovered in the tertiary deposits of the Sewalik Hills, in Hindustan.

CAMEL, *kăm'el:* machine for floating vessels over shoals and sand bars; invented in Holland abt. 1688 to carry ships across the Zuyder Zee. A long caisson is

secured to each side of the vessel and filled with water; this being pumped out, the camels in rising lift the ship with them. The contrivance has been used at New Bedford and Nantucket, as also in raising sunken vessels. The same principle is followed in floating docks.

CAMELEON, n. *kă-mē'lĕ-ŏn:* for CHAMELEON, which see.

CAMELFORD, *kăm'el-fĕrd:* town in the n.w. of Cornwall, England, near the source of the Camel (crooked brook), 14 m. w. of Launceston. It lies in a high and hilly tract near the moors. C. is said to have been the scene of a battle, 542, between King Arthur and Mordred, his nephew, when both were slain. The West Saxons, under Egbert, had a battle with the Britons here, 823. The ruins of King Arthur's Castle, Tintagel, stand on the high rocky coast, 4 m. n.w. of Camelford. Two m. n. of C. are the celebrated slate quarries of Delabole, employing a large number of men. Pop of C. abt. 1,600.

CAMELLIA, n. *kă-mēl'ĭ-ă* [after *Camellus*, a Moravian Jesuit, and traveller in Asia]: genus of plants of the nat. ord. *Ternstrœmiaceæ* (q.v.), natives of China, Japan, and the n. of India—some of which are now among the most admired green house shrubs in other countries too cold for their cultivation in the open air. They have been developed by florists into an endless multiplication of beautiful hybrids and varieties. The best known and most esteemed is *C. Japonica.* Its leaves are ovate-elliptical, almost acuminate and serrate, shining; the flowers without stalks, mostly solitary, large, and rose-like. It is a native of Japan; and there and in China it has been carefully cultivated from time immemorial. In its wild state it has red flowers; and the red single C. is much used by gardeners as a stock on which to graft the fine varieties, the flowers of which are generally double, and in many cases completely so. Many of them are of Chinese or Japanese origin; many have been raised by cultivators in Britain, continental Europe, and America. Their colors are very various; and the varieties also differ much in the form and position of the petals. It adds to the value of the C. that its flowering time is in autumn, winter, and spring. Sometimes entire houses are devoted to the culture of camellias. Some cultivators are careful to protect them from direct sunshine, others recommend an opposite treatment: it is agreed by all that free access of air is of great importance, and that water must be given very liberally, yet with such caution that the soil may never remain soaked after the immediate wants of the plant are supplied. The cultivation of camellias in the windows of houses is often attended with disappointment, from the buds dropping off when almost ready to expand, which is generally owing either to a neglect or an excess of watering; an apparently slight mistake in either direction working speedy damage. Too much heat at this time is also apt to cause the flower buds to fall off. The C. flowers well when the temperature is kept not very much above

the freezing-point, but frost it cannot bear. The proper soil for camellias is a loose black mold; a little sand and a little peat are often advantageously mixed with loam to form it. Camellias are propagated often by cuttings, often by layers; but the finest varieties generally by grafting or by inarching. The single camellia is also propagated by seed, and in this way the best stocks for grafting are procured.—Of the other species of camellia the most hardy, and one of the most beautiful, is *C. reticulata*, from which many varieties now in cultivation are partly derived. *C. oleifera* is extensively cultivated in China—not, however, in the more northerly parts—for its seeds, from which an oil is expressed after boiling, very similar to olive oil, and much in use as an article of food and otherwise in the domestic economy of the Chinese. The seeds of almost all the species, however, yield this oil.—*C. Sasanqua* bears the name of SASANQUA TEA. It is cultivated in China for its flowers, said to be used for flavoring certain kinds of tea.

CAMELOPARD, n. *kăm-ĕl′ō-pârd* [L. *camēlus*, a camel; *pardālis*, the female panther]: the giraffe; a wild animal with a long slender neck and spotted skin: see GIRAFFE.

CAMEL'S THORN (*Alhági*): genus of plants of the nat. ord. *Leguminosæ* (q.v.), sub-order *Papilionaceæ*, containing a number of herbaceous or half-shrubby species, natives chiefly of the deserts of the east, having simple leaves, minute stipules, racemes of red flowers, and jointed pods with one seed in each joint. These plants are of great importance on account of the food which they afford for camels, where other vegetation is scant; and camels are particularly fond of them. *A. camelorum*, a herbaceous species, yields a kind of Manna (q.v.), in drops, as of honey, on the leaves, afterward hardening. A similar exudation is yielded by *A. Nipalensis*, another herbaceous species; but it is not certain that the manna of Persia and Bokhara is produced, as has been alleged, by *A. Maurorum*, a shrubby species two or three ft. in height, which certainly does not yield it in India or Egypt: the supposition that this exudation results from some peculiarity in the climate of Persia and Bokhara, is less probable than that of a mistake concerning species not very dissimilar.

CAMENES, n. *kăm′-ĕn-ēz*, (a word without etymological meaning, but designed to have its letters symbolic); in logic, the second mode of the fourth figure of syllogisms. See SYLLOGISM and MOOD in logic.

CAMEO, n. *kăm′ĕ-ō* [It. *cammeo:* F. *camaieu*—said to be from Pers. *camahen*, loadstone, as having been first employed for signets]: gems engraved in relief; as distinguished from those that are hollowed out so as to yield a raised impression, which are called *Intaglios*. The term cameo however, is applied more especially to those diminutive pieces of sculpture which are prepared from precious stones having two strata or layers of different colors, the undermost of which is left to form

the background, the object to be represented being cut in the upper one. The stone generally used for this purpose by the ancients was the variegated onyx.

The art of cameo-cutting is of great antiquity. It is believed to have been of Asiatic origin, and to have been practiced by the Babylonians, from whom the Phœnicians carried it into Egypt. From the Egyptians it was transmitted to the Greeks, who brought it to great perfection; and afterward it was practiced extensively, and more successfully than perhaps any other art, in Rome. To what extent the gems commonly called Etruscan are in reality early Greek, is a subject of dispute among the learned. It was not till a comparatively late period—the age following Praxiteles—that cameo cutting became popular in Greece; and it was chiefly in the courts of the successors of Alexander that it was patronized. At this period cameos were extensively used, not only as personal ornaments, but in cups, vases, candelabra, and other objects of domestic luxury. Pateræ and other vessels were frequently worked out of a single stone, upon which were exhibited a whole series of figures of exquisite workmanship. Many antique cameos which have been preserved are wonderfully beautiful both in design and execution. The finest known specimen is said to be the Gonzaga Cameo, formerly at Malmaison, now at St. Petersburg. It represents the head of a prince and his wife, probably Ptolemy I. and Eurydice. Winckelmann mentions a cameo representing Perseus and Andromeda, in such high relief, that almost the whole contour of the figures, which are of the most delicate white, is detached from the ground. It belonged to the painter Mengs, and at his death was purchased by the Empress Catharine of Russia. The only other gem which Winckelmann is disposed to rank with that just mentioned, is 'the Judgment of Paris' in the cabinet of the Prince Piombino at Rome. Of cameos of the Roman time, many fine specimens are in the Continental museums. The most celebrated cameo in England is the 'Cupid and Psyche' in the Marlborough collection, by Tryphon, who is supposed to have lived in Macedon under the immediate successors of Alexander. The stones on which many of these cameos are cut are of surprising, and, in modern times, unequalled size and perfection. They are supposed to have been procured by the ancients through their Oriental and African commerce. Cameos do not seem to have been made in mediæval times; but the art revived in Italy, under the auspices of the Medici, and the production of camoes, both in *pietra dura* and in shell, has there become a branch of art-manufacture of considerable importance. Impressions from antique cameos in glass, sulphur, porcelain, and other materials, are produced in many places; and for artistic purposes possess all the value of the originals.

Glass Cameos.—The manufacture of cameos from artificial substances was known to the ancients. One of the most beautiful specimens of an imitation of cameos in

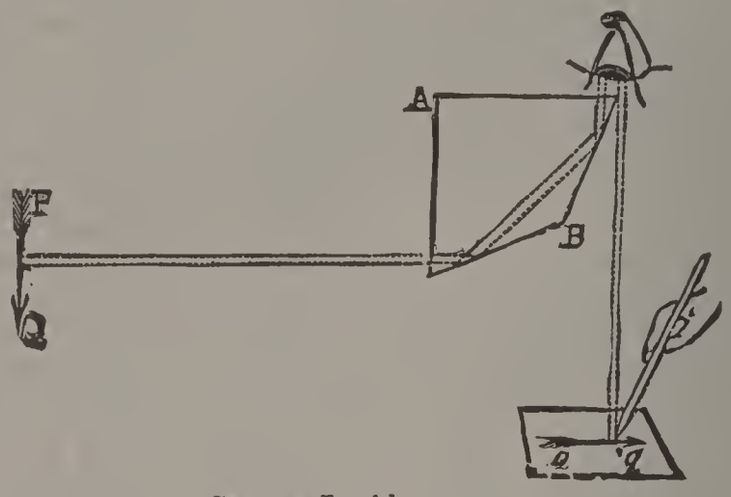
glass is the famous Barberini or Portland vase, now in the British Museum. The ground is blue; the figures, in low relief, of a delicate, half-transparent white: see PORTLAND VASE. Many fragments of the same kind of manufacture are in other cabinets, but this is believed to be the only perfect example.

Shell Cameos.—The art of imitating cameos in shell, which has now attained such perfection as to rival the delicacy and finish even of antique workmanship, and which is a process quite as artistical as their production from gems, is of modern invention. The shells, like the stones, chosen for this purpose, are such as possess layers of different colors. The most useful are the *Bull's Mouth,* the under layer of which is red, resembling the sardonyx; the *Black Helmet,* which has a dark onyx ground; and the *Queen's Conch,* of which the ground is pinkish. These shells have three strata, the undermost of which forms the ground, the figure being sculptured in the second, and the third serving to mark the hair, wreaths, armor, and other more prominent objects. The portion of shell having been prepared of the requisite size, form, and thickness by various mechanical means, it is fixed by some adhesive substance—usually rosin—to a small block of wood, of such form and thickness as to be conveniently grasped by the artist in his left hand. The outline of the object or objects to be represented is then sketched with a pencil, and, in the case of portraits, is usually copied from a previous pencil-sketch on paper. The pencil-marking on the shell is then followed with a scratch-point, and the surrounding white substance is removed by means of files and gravers. This latter process, which is more mechanical than the rest, is usually performed by an assistant. The artist then proceeds slowly and carefully to work out his subject by the use of smaller tools; those used at last for deepening the finer lines being scarcely larger than ordinary darning-needles. The manufacture of shell-cameos in Rome began about 1805, and is said to have been of Sicilian origin. The art was at first confined to Italy; but during the last 35 years, it has been carried on in Paris to a greater extent than even in Rome, though not with equal success.

CAMERA, n. *kăm′ėr-ă* [L. *cămĕra;* Gr. *kamăra,* an arched roof, a chamber: It. *camera*]: a chamber or compartment for exhibiting, by means of reflection, any external thing; a reflection or miniature of the thing or house. CAMERA-LUCIDA, *-lô′sĭ-dă* [L., a light chamber]: an instrument for so reflecting images of objects on paper, etc., as to allow them to be sketched. CAMERA-OBSCURA, *ŏb-skū′ră* [L., dark chamber]: a darkened chamber or box, in which, by means of lenses, external objects, in their natural colors, are exhibited on any white flat surface within it. CAM′ERAL, a.: pertaining to a camera. CAM′-ERATED, a. *-ā-tĕd,* divided into chambers, as certain shells; arched. IN CAMERA, in a council-chamber; in a private

room, when the matter or cause is not fit for the open court; in their private rooms to hear applications, as judges.

CAMERA LUCIDA, *kăm'ĕr-a lō'sĭ-da:* optical instrument for reflecting images of objects on paper, etc. Dr. Wollaston's C. L., intended to facilitate the perspective delineation of objects, consists of a small quadrilateral prism of glass, of which AB in the annexed figure is the perpendicular section, held in a brass frame, which is at-



Camera Lucida.

tached to an upright rod, having at its lower end a screw-clamp, to fix it to the edge of a table. The prism being at the height of about a foot from the table, has its upper face horizontal. Two of its faces, as in the figure, are at a right angle at A; the contiguous faces make respectively with them angles of 67½°, so that the remaining obtuse angle at B contains 135°. Rays coming from an object PQ, and falling nearly perpendicularly on the first surface, enter the prism and undergo total reflection at the contiguous surface (see DIOPTRICS); they then fall at the same angle on the next surface, and are totally reflected again; finally, they emerge nearly perpendicularly to the remaining surface. An eye, as in the figure, then receives the emergent pencil through one part of the pupil, so that an image, *pq*, of the object is seen projected upon a sheet of paper upon the table. The rays from the drawing-pencil passing the edge of the prism, enter the other part of the pupil; and the pencil and image being seen together upon the paper, a sketch of the latter can be taken. There is, however, a practical difficulty—the image and the drawing-pencil are at distances sensibly different from the eye, and so cannot be seen together distinctly at the same time. To obviate this, a plate of metal, with a small aperture as an eye-hole, is placed at the edge under the eye, so that the rays through the prism, and those from the drawing-pencil, which both pass through the eye-hole, form only very small pencils. By this, the difficulty is greatly diminished. It is still, however, difficult to use the instrument satisfactorily; and though many acquire great readiness in its use, others have never been able to attain facility. The instrument is remarkable for its small

bulk and portability. A good one will pack in a box 8 inches by 2, and half an inch deep. Besides this common form of the C. L., there are others. Its simplest form is merely a piece of smooth glass fixed at an angle of 45° to the horizon. An image from a horizontal object falling on this glass will be perfectly reflected, and that in the vertical, so that the eye looking vertically down will see the image, and, owing to the transparency of the glass, the artist will be able to trace it out upon paper below. In this case, however (see CATOPTRICS), the image will be inverted.

CAM'ERA OBSCURA, *ŏb-skū'ra:* optical instrument for exhibiting in a darkened chamber or box external objects in their natural colors; invented by Baptista Porta in the 16th c. It is familiar in its simplest form as a toy, consisting of a rectangular box, furnished at one end with a lens whose focal length is equal to the length and depth of the box, at the opposite end of which a plane reflector is placed at an angle of 45°, which throws the image of any objects to which the lens may be directed on a piece of ground-glass on the top of the box in a non-inverted position, so that they may be viewed or sketched from as in nature. The C. O. being now indispensable in the practice of photography, has received a number of recent improvements, which make it a scientific instrument. The principle, however, involved in the simplest and most refined forms is the same, and may be illustrated

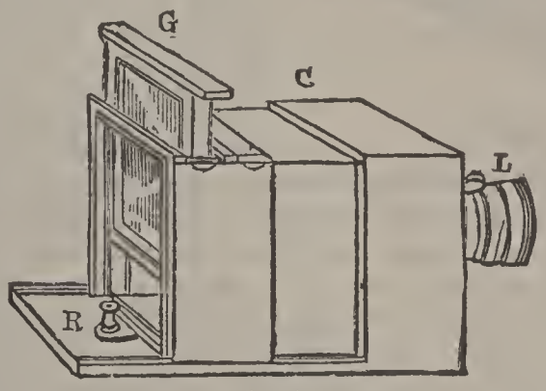


Fig. 1.

and made intelligible by the following experiment: Let a small hole be bored in a window-shutter, and the room be darkened. If, now, the beam of light entering the room by this hole be intercepted by a sheet of white paper, held at a small distance from the hole, an inverted image of objects without will be seen upon the paper. By placing a small convex lens over the hole, this image is rendered much more distinct, or *sharp*, in photographic language. Moreover, it will be found that, at a certain distance from the hole, the image attains a maximum degree of sharpness; and that if the paper be removed from this point to any position either nearer to the hole or further from it, the image becomes indistinct and confused. At the point of greatest distinctness, the image is said to be *focused*. Such being the principle of the camera,

it is evident that in practice the instrument may assume many forms, provided always that it consists of a darkened box or chamber having a hole at one end for the insertion of a lens, or combination of lenses, and at the other a screen, generally made of ground-glass, on which to receive the image. Fig. 1 will at once give an idea of a very common and simple form of camera. C is the body of the instrument, made of any opaque substance; L, the tube or tubes, generally formed of brass, and containing one or more lenses; G, the obscured or ground-glass, upon which the image is thrown for the purpose of adjusting the focus; R, the rack behind, by means of which, and the double sides of the camera, the body of the instrument may be lengthened or shortened till the image on the ground-screen is accurately focused. This rack is most frequently placed upon the tubes carrying the lenses. The interior of the whole apparatus is blackened, to prevent reflection of the rays falling on their sides, and to impart greater distinctness to the picture. S, in fig. 2, represents the *camera-slide.* This is a thin, dark box, and is used for conveying a sensitive plate from the operating-room to the camera, and back again after exposure. It consists of a rectangular frame, made to fit exactly into the back of the camera when the focusing-screen is removed. At the back is a hinged door, by means of which the plate is introduced into the slide; and in front is a shutter, which is pulled up when the plate is to be exposed, and shut down after the time requisite for the action of the light upon the plate has expired. It must be constructed so that, when substituted for the focusing-screen G (fig. 1), the surface of the prepared plate, which is intended to receive the image, shall correspond exactly in distance from the lens with the ground-surface of the focusing-screen. The plate rests upon projections of silver wire in the corners of the slide; and the same slide may be used for plates of different sizes, by introducing into it thin frames of suitable dimensions also furnished with silver-wire corners.

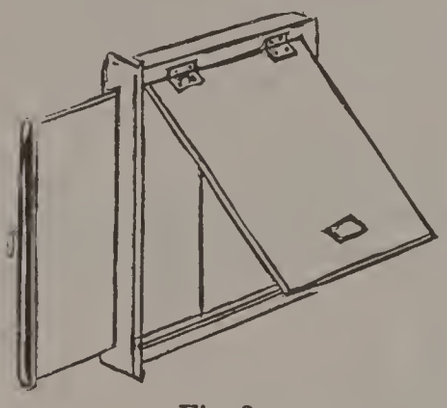


Fig. 2.

Photographic cameras are generally required for one of three purposes—viz., portraits, landscapes, or copying; and for each of these it is necessary to make suitable modifications in the construction of the instrument. A camera has, however, been recently contrived which combines within itself the conditions necessary for all contingencies. It is called Martin's universal portrait, landscape, and copying camera, and consists, primarily, of a baseboard, 30 inches long and 11 inches wide, divided into three pieces, and hinged together by means of broad brass hinges, so as to diffuse the bearing as much as possible,

and bolted together when in use by sliding panels of mahogany, extending across the entire width of the base-board. This base-board, being grooved on its outer edges, allows the sliding portions of the camera to be moved from one end to the other, so as to alter the relation between object, lens, and image *ad infinitum*.

What may be regarded as the body of the camera, is of the same construction as an ordinary expanding camera except that it is furnished with additional apertures for camera slides, and the front and the back are united by means of an accordion or bellows body of suitable length to extend from one end of the base-board to the other.

CAMERARIUS, *kâ-mā-râ′re-us*, JOACHIM—originally *Liebhard*, which name he changed into C. because his forefathers had been *Kämmerer* (chamberlains) at the court of the Bishop of Bamberg: 1500, Apr. 12—1574, Apr. 17; b. Bamberg, Germany. He was by nature earnest and taciturn; but the extent of his knowledge, his sobriety of opinion, strength of character, and, on occasion, overpowering eloquence, won for him the esteem of all his contemporaries. He died at Leipsic after a life devoted to literature. His works, of which several are still valuable, include an excellent biography of Melanchthon, and a collection of letters by this reformer; also annotations on Cicero's *Quæstiones Tusculanæ* (1525), *Elements of Rhetoric, Commentarii Linguæ Græcæ et Latinæ* (1551), and *Epistolæ Familiares* (1583–95), giving interesting notices of his times.

His son, JOACHIM C. (1534–98), was one of the most learned physicians and botanists of his age.

CAMERARIUS, RUDOLPH JAKOB: 1665–1721: German botanist, in charge of the botanic garden at Tübingen. To him is ascribed the discovery of the sexual relation in plants. He was also a medical professor.

CAMERINO, *kâ-mā-rē′nō* (anc. *Cammerinum*): town of central Italy, province of Macerata, on a hill at the foot of the Apennines, 41 m. s.w. of Ancona. It has a cathedral, occupying the site of a temple to Jupiter, a university, and some manufactures of silk. Its bishopric dates from the 3d c.; and it was an archiepiscopal see 1787. Pop. 4,500.

CAMERLENGO, n. *kăm′ėr-lĕng′gō* [It. *camerlingo*, a chamberlain]: one of the highest officers of the Roman court. A CARDINAL CAMERLENGO, during a vacancy in the holy see, takes charge of all the temporalities, and presides over the apostolic chamber or palace.

CAMERON, *kăm′ėr-ŭn*, ARCHIBALD, American clergyman: b. Scotland, about 1770; d. 1836. After studying at Transylvania Seminary, Lexington, Ky., he was ordained in 1796, and in the same year assumed charge of churches at Big Spring, Akron, and Fox Run. Until 1828 he performed itinerant services, and then became minister of the churches at Mulberry and Shelbyville. The Presbyterian church in Kentucky owes much to his pioneer

labors. His published works include: *The Faithful Steward* (1806); *An Appeal to the Scriptures* (1811); *A Defense of the Doctrines of Grace* (1816); and *A Reply to Some Arminian Questions on Divine Predestination* (1822).

CAMERON, Arnold Guyot, American educator: b. Princeton, N. J., 1864, March 4. He was graduated at Princeton University in 1886, and during the next two years studied abroad. In 1888–91 he was professor of French and German languages and their literatures in Miami University; in 1891–7, assistant professor of French in the Sheffield Scientific School of Yale University; in 1897 accepted the chair of French at the John C. Green School of Science of Princeton University, which he held till 1900, when he became Woodhull professor of French at Princeton. He is editor of the text-books: *Daudet; Mérimée; Loti; Coppée and Maupassant; The Goncourts; Tales of France; Zola; Richepin*, etc.

CAMERON, Sir Charles, Scotch journalist and politician: b. Dublin, 1841. He was educated at Madras College, St. Andrews, Trinity College, Dublin, and at medical schools in Paris, Berlin, and Vienna. He edited the *North British Daily Mail* from 1864 to 1874, and from the latter year till 1885 was member of Parliament for Glasgow. From 1885 to 1895 he sat for the College division, Glasgow, and for the Bridgeton division 1897–1900. The adoption of sixpenny telegrams was the result of a resolution which he introduced in the House, and he was likewise instrumental in the conferring of municipal franchise upon women in Scotland. His publications include many pamphlets on political, social, and medical subjects.

CAMERON, Sir Charles Alexander, Irish physician: b. Dublin, 1830, July 16. He was elected public analyst for the city of Dublin in 1862. He was the only one who succeeded in applying the Adulteration of Food Act of 1860. In 1867 he was elected professor of hygiene or practical medicine in the Royal College of Surgeons, in Ireland. His lectures on hygiene, open to ladies, were largely attended. He was knighted in 1886, in recognition of his services to public health. He has written: *Chemistry of Agriculture* (1857); *Lectures on Public Health* (1868); *History of the Royal College of Surgeons, Ireland*, etc. (1886); *Elementary Chemistry and Geology* (1896), etc.

CAMERON, Charles Duncan, English soldier: d. 1870. He served in the Kaffir war (1846–7), in the Crimean war, and later at Kars. In 1862 he became British consul in Abyssinia, and having undertaken to deliver a letter from Queen Victoria to King Theodore, was imprisoned by the king for two years on the charge of interfering in the politics of that country. He was released only to be shortly imprisoned again, together with Rassan, agent of the British government, and others, their final release being effected by the advance of English troops upon Theodore's territory. An account of these matters by Cameron was published in the *Parliamentary Printed Papers* (1868–9).

CAMERON, Donald Andreas, English civil servant; b. 1856. He filled the post of consul at Suakin, 1885–8, and at Bengazi, 1888–9. He was judge of the native court of appeals at Cairo 1889–97 and then, returning to the consular service, became consul at Port Said for the Suez Canal. He has published *Arabic-English Vocabulary* (1892); *Egypt in the 19th Century* (1898).

CAMERON, Emily Lovett, English novelist: b. Walthamstow; married to H. Lovett Cameron, about 1876. Her novels deal mostly with personal complications and include: *Juliet's Garden* (1877); *Deceivers Ever* (1878); *Vera Nevill* (1880); *In a Grass Country* (1885); *The Cost of a Lie* (1886); *The Dead Past* (1886); *Pure Gold* (1887); *A North Country Maid; Jack's Secret; A Sister's Sin; A Bad Lot; A Soul Astray; The Craze of Christina; Bitter Fruit; An Ill Wind; A Passing Fancy; Midsummer Madness;* etc.

CAMERON, George Frederick, Canadian poet: b. New Glasgow, Nova Scotia, 1854; d. 1885. He was educated at Queens' University, Kingston, Ontario; resided for a time in the United States; returned to Canada, and edited the Kingston *News*. As a lyrical poet he has received high praise from leading critics, and was accorded an eminent position by some of the great contemporary English poets. See Stedman, *Victorian Anthology* (1895).

CAMERON, Henry Clay, American educator: b. Shepherdstown, Va., 1827, Sept. 1; d. 1906, Oct. 26. He was graduated at Princeton College in 1847, and at the Princeton Theological Seminary in 1855; and was connected with the department of Greek at Princeton from 1852 till his death. He was twice chosen to the Presbyterian General Assembly, and wrote *Princeton Roll of Honor; History of the American Whig Society; Old Princeton: Its Battle, Its Cannon,* etc.

CAMERON, Hugh, Scottish artist: b. Edinburgh, 1835. He is a well-known and popular painter of portraits and figure pieces, and among his works are: *Maternal Care; Age and Infancy; Haymakers Resting; A Lonely Life; The Rivals; The Timid Bather; The Village Wall; Rummaging; Crossing the Burn; Children of the Riviera; Pleasures of the Sea,* etc.

CAMERON, James Donald: banker: b. Middletown, Dauphin co., Penn., 1833, May 14; son of Simon C. He graduated at the College of N. J. 1852; entered the Middletown bank as clerk, and afterward became its cashier and pres.; was pres. of the Northern Central railroad co. of Penn. 1863–74; sec. of war 1876–7; delegate to the national republican conventions 1868 and 76; chairman national committee and delegate to the national convention 1880; succeeded his father as U. S. senator 1877 and was re-elected 1879, 1885 and 1891. In 1890 he was chairman of the committee on naval affairs, and member of the committees on coast defenses, milit. affairs, inquiry into

claims of citizens of the United States against Nicaragua, the civilized tribes of Indians, and the quadro-centennial.

CAMERON, John: abt. 1580–1625; b. Glasgow: scholar and divine. He was educated at the univ. of that city, where, in his 20th year, he held an appointment as reader in Greek. In 1600, he set out to travel in France, where his ability and erudition secured for him a philosophical professorship in the Univ. of Sedan. He afterward acted as a Prot. clergyman at Bordeaux, and, on the death of Gomarus, was appointed to the divinity chair in the Univ. of Saumur, which he held until 1620. Returning to Britain, he was appointed prof. of divinity at Glasgow; but in less than a year he returned to Saumur; thence to Montauban, where he received a divinity professorship. Here his opposition to the party who advocated a civil war made him many enemies, by one of whom he was stabbed in the street, and he died from the wound. He was considered one of the best scholars of his time; in biblical criticism he was inclined to be perverse, usually in difficult passages choosing the opposite view to that held by other divines, especially Beza. His theological opinions inclined to looseness, his works being said to be the foundation of Amyraut's doctrine of universal grace.

His followers in France became a sect known as Cameronites, moderate Calvinists, holding that man's will is determined only by his practical judgment, so that the will is not physically or otherwise coerced by God, but only moved morally by Him through infusing knowledge into the mind. This doctrine, which has found favor with some eminent theologians, is doubtless an unconscious modification of Calvinism in the minds of many adherents of that doctrine.

CAMERON, Richard: a Scottish Presbyterian preacher who suffered death, 1680, July 20, as an irreconcilable upholder of the 'Covenant,' and from whom the religious sect of Cameronians (q.v.) was named. He belonged to the extreme party, who held by the perpetually binding obligations of the Solemn League and Covenant (see Covenants), which were set aside at the restoration of Charles II. With some others, he strenuously resisted those measures that reinstated the Episcopal Church in Scotland, and that proscribed the meetings for public worship of unauthorized religious bodies. Contrary to law, he persisted in preaching in the fields, and became obnoxious to the government, to which, indeed, he finally assumed an attitude of defiance. In 1680, June, he, in company with about 20 persons of equal zeal, well armed, entered the town of Sanquhar; and in the market-place they formally renounced their allegiance to Charles II., who had so grossly abused his power, and declared war against him and all his adherents. After this act, they retired to the hills between Nithsdale and Ayrshire, where they evaded capture for a month, though a price of 5,000 merks had been set upon his head by the government, and 3,000 upon the heads of

the others. They were surprised by a vastly superior force in Aird's Moss, and after a brave fight, Cameron was killed. His hands and head were cut off, and fixed upon the Netherbow Port, Edinburgh. Cameron ranks as a martyr, and has an honorable place in the history of *Scots Worthies*

CAMERON, Sir Roderick William, Canadian capitalist: b. Williamstown, Ontario, 1825, July 25: d. 1900, Oct. 24. He entered mercantile life in New York as a youth and acquired a large fortune as an exporter and importer. He was knighted in 1883. He was well known as a turfman and yacht owner, and was prominent in Canadian-American diplomacy.

CAMERON, Simon: 1799, Mar. 1—1889, June 26; b. Lancaster co., Penn.: statesman. He received a limited education; learned the printer's trade; worked in Lancaster, Harrisburg, and Washington, became editor of a newspaper in Doylestown 1820 and in Harrisburg 1822; engaged in railroad construction and banking; was appointed adjt.gen. of Penn.; succeeded James Buchanan as U. S. senator and acted with the democrats; joined the people's party, voted for Gen. Fremont for pres., and was again elected U. S. senator 1856; joined the republican party and was delegate to the convention that nominated Abraham Lincoln 1860; was sec. of war 1861–2; U. S. minister to Russia 1862; re-elected U. S. senator 1866 and 72; succeeded Charles Sumner as chairman of the committee on foreign affairs 1872; and resigned as senator and was succeeded by his son, James Donald Cameron, 1877. He spent his last years in foreign travel, and in the quiet retirement of his Donegal estate.

CAMERON, Verney Lovett, d.c.l.: explorer: b Radipole, Dorsetshire, England, 1844, July 1; d. Leighton Buzzard 1894, Mar. 26. He was educated at Bruton, Somersetshire; was appointed cadet in the British navy 1857; promoted midshipman 1860, sub-lieut. 1963, lieut. 1865, commander 1876, and was retired 1883. He served in the Abyssinian war; accompanied Sir Bartle Frere on the special mission to Zanzibar; took charge of the East Coast Livingstone Search Expedition organized by the Royal Geographical Soc., and after Livingstone's death terminated the purpose of the expedition, crossed tropical Africa on foot from e. to w.—nearly 3,000 m. In this journey he followed the course of the Lualaba river, which he discovered belonged to the Congo instead of the Nile, as previously believed; explored 1,200 m. of new country, and located the watersheds between the Nile, Congo, Zambesi, and other rivers. He visited Syria and Mesopotamia 1878–9; with Richard F. Burton undertook a journey of exploration in the country beyond the Gold Coast Colony 1880; and after 1888 was very active in exposing the horrors of the slave trade in central Africa. He had published several accounts and surveys of his travels, notably *Across Africa* (1877); *Our Future Highway to India* (1880); and *To the Gold Coast for Gold* (1883).

CAMERONIAN, n. *kăm'ĕr-ō'nĭ-ăn :* a follower of Richard Cameron, in Scotland, who refused to accept the indulgence granted by Charles II. to the Presbyterian clergy; one of an extreme Presbyterian sect.

CAMERONIAN REGIMENT, *kăm-ĕr'ō'nĭ-an,* now CAMERONIANS (Scottish Rifles): long the 26th infantry regt., had its origin in a body of Cameronians (q.v.) during the revolution of 1688. Taking advantage of their zeal and courage, the convention which sat at Edinburgh induced a number of them to assist in the revolution, which it was imagined by some was to re-establish the Covenants (q.v.). They were induced to enlist on the understanding that the special object of the corps was 'to recover and establish the work of reformation in Scotland, in opposition to popery, prelacy, and arbitrary power, in all the branches and steps thereof, till the government in church and state be brought to that lustre and integrity which it had in the best of times.' (See Burton's *History of Scotland,* i. 49.) Thus was formed the celebrated C. R., with the youthful Lord Angus as col., and William Cleland as lieut.col. and actual commander. Under Cleland, not yet in his 30th year, the regiment was sent northward to quell the insurrection, after the fall of Viscount Dundee. Surrounded by from 4,000 to 5,000 Highlanders, the Cameronians, only 800 strong, gallantly defended themselves during a whole day in Dunkeld, 1689, Aug. 21. In this terrific struggle, the brave Cleland was killed. Considering the issue of the revolution, they had been entrapped into military service, and their employment on foreign service afterward greatly scandalized the Cameronian sect. The regiment has ever done credit to its origin, being distinguished alike for gallantry and for good conduct.

CAMREO'NIANS: religious sect in Scotland properly named after Richard Cameron (q.v.). Its official designation, however, is that of Reformed Presbyterian. No doubt, the principles of the body are those for which Cameron contended and died: but not till after 1688 did the small body of Presbyterians, who insisted upon the restoration of the civil and ecclesiastical polity of 1638–49 in opposition to the Revolution settlement, assume a distinct form. According to the Solemn League and Covenant, ratified by the parliaments of England and Scotland, also by the Assembly of Divines at Westminster 1643, Presbyterianism was to be maintained in the kingdoms of England, Scotland, and Ireland, and popery, prelacy, superstition, heresy, schism, etc., were to be extirpated. As a measure of pacification, Presbyterianism was established in Scotland by act of parliament, 1690; but it was of a modified kind, rendering the church a creature of the state, particularly as regards the calling of general assemblies. Equally to the disgust of the extreme party referred to, prelacy was confirmed in England and Ireland, and there was a general toleration of heresy—i.e., dissent. In sentiment, if not in form, therefore, this party repudiated the government of William III. and his successors, and maintained the perpetually binding obligations of the Covenants. Unquestionably, these C.

acted under strong convictions, and only desired to carry to a legitimate issue theoretical principles of the Church of Scotland which, for prudential considerations, have been practically in abeyance; and in the standards of this sect is found a true embodiment of the tenets held by the great body of English and Scotch Presbyterians of 1643. Although thus an elder sister of the existing Church of Scotland and all its secessions, it was with some difficulty that, after the Revolution, it organized a communion with ordained ministers. The steadfastness of members was put to a severe trial by the defection of their ministers; but in 1706, after their faith and patience had been tried for 16 years. they were joined by the Rev. John M'Millan, from the Established Church; and shortly afterward by the Rev. John M'Neil, licentiate of the same church. To confirm the faith of members, and give a public testimony of their principles, the covenants were solemnly renewed on Auchensauch Hill, near Douglas, Lanarkshire, 1712. The subsequent accession of the Rev. Mr. Nairne enabled the C. to constitute a presbytery at Braehead, in the parish of Carnwath, 1743, Aug. 1, under the appellation of the Reformed Presbytery. Other preachers afterward attached themselves to the sect, which continued obscurely in the w. of Scotland and n. of Ireland. For their history and tenets see the *Testimony of the Reformed Presbyterian Church* (Glasgow, John Keith, 1842). Holding strictly to the covenants, and in theory rejecting the Revolution settlement, the political position of the C. is very peculiar, as they refuse to recognize any laws or institutions which they conceive inimical to those of the kingdom of Christ; from which cause many of them formerly isolated themselves from general society, and refused several of the responsibilities and privileges of citizens. In 1860, there was an attempt on the part of some of the kirk-sessions to prevent the members becoming volunteers, on account of the oath of allegiance which required to be taken. On the question coming before the synod, it was decided (1863) that excommunication for taking the oath should cease. In consequence of this decision, 10 or 12 congregations seceded. In 1876, the larger body of the Reformed Presbyterians, consisting of about 45 congregations, was formally united to the Free Church of Scotland, so that the distinctive features of the Cameronians are now represented by the few congregations which seceded 1863.

CAM'ERONITES: see CAMERON, JOHN.

CAMEROONS, *kăm-er-ônz':* river of Upper Guinea, Africa, which enters the Bight of Biafra from the n.e.; abt. lat. 4° n., long. 9° 40′ e., by an estuary some 20 m. in breadth. Its length is not known, but for 40 m. upward its breadth averages nearly a quarter of a mile, its depth varying in the dry season from 2 to 20 ft. The left bank of the river is steep and high, the right for many miles low and swampy, and covered with mangroves. There are several populous and thriving villages on its banks, whose inhabitants carry on an extensive trade in palm-oil, and ivory, obtained in great quantity from dead elephants, which have perished in search of water in a great morass inland.

CAMEROONS PEAK: culminating point in the Cameroons Mountains, which in lat. 4° 13′ n., and long. 9° 10′ e., has an elevation estimated at 13,000 ft. The mountains cover abt. 700 sq. m., bordered on the w. and s. by the Gulf of Guinea.

CAMESTRES, n. *kă′-mĕs-trēs* (a word without etymological meaning, but designed to have its letters symbolic): in logic, the second mode of the second figure of syllogisms. See SYLLOGISM and MOOD in logic.

CAMILLA, *ka-mĭl′la:* swift-footed virgin in ancient Roman fable; said to be the daughter of king Metalus.

CAMILLUS, *ka-mĭl′lŭs*, MARCUS FURIUS: celebrated Roman patrician, who first appears as consular tribune, B.C 403; d Rome, B.C. 365. His military career was a series of unbroken successes, according to the accounts which have come down to us; but these accounts have been shown by Niebuhr to be largely mixed with mythological or poetic fiction. In 396, CAMILLUS was made dictator, during the Veientine war, in which he mined and captured the city of Veii; but the proud splendor of his subsequent triumph offended the Roman populace, who were still further displeased when Camillus demanded a tithe of the spoils of Veii, in order to fulfil a vow made to Apollo, on condition of victory. In 394, Camillus was again elected consular tribune, and besieged the Falerii, who after bravely defending themselves, were led by a magnanimous act of Camillus to yield unconditionally. Afterward Camillus, being accused of peculation, and foreseeing certain condemnation, banished himself from Rome, 391, and lived in retirement at Ardea, until Brennus, at the head of his wild Gauls, had swept through Etruria, and captured and destroyed the whole of Rome except the Capitol. Camillus was now recalled, and appointed dictator a second time He achieved a decisive victory over the invaders, rebuilt Rome, and obtained new victories over the Volsci, and others. In B.C. 386, he was elected dictator for the third time, but refused the office. In 381 Camillus was victorious in the war of Rome against Præneste and other Latin towns; and in 368, he was elected to his fourth dictatorship, but abdicated during the same year. In B.C. 367, when war broke out with the Gauls, Camillus, though 80 years old, accepted the dictatorship for the fifth time, defeated the barbarians near Alba, and made peace between patricians and plebeians. After this, he erected near the Capitol a temple to Concord, and, having retired from public life, died of the plague, lamented by the whole Roman people.

CAMILLUS and CAMILLA: in anc. Rome, a boy and a girl taking part in sacrificial ceremonies.

CAMISADE, n. *kăm′ĭ-sād* [F.—from F. *chemise*—from mid. L. and Sp. *camisa*, a shirt]: an attack made by soldiers in the dark—so called from their putting their shirts over their dress to distinguish each other by. CAMIS, n. *kăm′ĭs*, and CAMESE, n. *kăm-ēz′*, a shirt or smock-frock, a tunic.

CAMISARDS, *kăm'ĭ-zârdz* or *kă-mē-zăr:* in French history, name given to the Protestants of the Cévennes who rose in revolt against Louis XIV. In 1685 the revocation of the Edict of Nantes, taking away the securities for the Prot. religion in France and suppressing its exercise, had caused on the one hand a great emigration of Huguenots, especially from the s. provinces, and on the other hand to a wide extent a formal compliance with Rom. Cath. observances. The new converts were treated with suspicion by the royal government, and on their own part were uneasy in conscience and lax in their allegiance to the persecuting power. Here and there Prot. pastors braved all dangers in order secretly to remain with their flocks. Meetings were held in the forests and among the mountains. A lull in the persecution was followed by yet more cruel acts after the peace of Ryswick. Claude Brousson, a man especially revered among the Protestants, was broken on the wheel at Nîmes in 1698 for corresponding with foreign governments. This and other such acts roused violent excitement, especially in the Cévennes mountains. Prophesyings and other manifestations of fanatical enthusiasm grew frequent. Finally one night, 1702, July, a hundred armed men, masked and wearing white shirts (whence the name *Camisards*), attacked Pont-de-Montvert and put to death the Abbé du Chayla, a noted persecutor. The Count de Broglie, military gov. of Languedoc, captured and executed several of these men. But the insurrection rapidly took on greater proportions. Nocturnal attacks were made from the mountains. The militia of the province, ill-organized or disaffected, could make no headway against the rebels. Emboldened, the C. made their attacks and exercised the rites of their religion openly. Bold and able leaders, frequently old soldiers, conducted their parties. The most celebrated of their chieftains was a young peasant, 20 years old, Jean Cavalier (q.v.), a zealous Huguenot, who had been a baker's boy at Geneva, but returning to the Cévennes, showed so great a genius for organization that all the bands of insurgents were placed under his orders. He defeated a detachment of royal troops in Dec. and seized Sauve. In 1703, Jan., one of his lieutenants defeated the Count de Broglie in person in the plain of Nîmes, where the C. burned 40 parish churches and killed 80 priests.

But the war of the Spanish succession was now in full course, and the C., conscious that they could not expect permanently to maintain the struggle alone, sent out their agents to the Prot. courts of all Europe to obtain pecuniary and military support, and also to seek aid from the prosperous Huguenot refugees in England, the Netherlands, and Germany. In England and in the Netherlands there was strong interest in their cause, not only from religious reasons but from a sense of the political advantages which the allies would derive from fostering an internal struggle against Louis XIV., and of the strategical importance of operations having the Cévennes as a basis, especially in view of their nearness to Catalonia, in which revolt against

Philip V. was anticipated. The English admiral, Sir Cloudesley Shovel, was sent with assistance; but before he could succeed in establishing connections the insurrection had begun to fail. Marshal de Montrevel, sent against the rebels with 10,000 infantry, dragoons, and artillery, had defeated Cavalier and driven the C. from the Mediterranean coast. But he conducted his operations with so much cruelty toward non-combatants as to excite more violent opposition. 31 parishes in the middle region of the Cévennes were laid waste, in order to reduce the insurgents. The expeditions of the latter grew more vindictive, especially in the hands of the *C. noirs*, so called because they blackened their faces with soot. Reprisals followed on the part of the Rom. Catholics, organized under the name of *cadets de la croix*. In 1704, Mar., Cavalier surprised a French regiment and cut it in pieces. But soon afterward his own band was almost wholly destroyed, and he escaped with difficulty; and aid from Savoy, the Netherlands, and England was inadequate, or did not arrive in season.

Impatient at the prolongation of the revolt, Louis XIV. replaced Montrevel by one of his most eminent generals, Marshal Villars, who, perceiving that, while in part the C. consisted of bandits devoted to plunder, the majority were 'Frenchmen, very capable and very brave,' proclaimed an amnesty to all who should lay down their arms within a week; those so surrendering should have their choice between emigration, with compensation for their property, or remaining, under guarantee of known Rom. Catholics, who should be their sureties. Those not giving themselves up on these terms were to be pursued without pity. By skilful dispositions of his troops he made ready to execute this threat summarily. Cavalier and the most intelligent chiefs of the rebels entered into negotiations with Villars, demanding the free exercise of their religion and the liberation of those adherents of it who had been condemned to the galleys. Villars declared that the king would never consent to the former, but promised the latter. He offered also to form those who should surrender into a regiment for the defense of France, and offered the colonelcy of it to Cavalier, who accepted. But other chiefs accused Cavalier of treachery; he could bring with him but a hundred men. He was sent to Alsace with these, but, conceiving a distrust of the government, went over to the enemy and took service in the army of the Allies.

Meantime the rest of the C., returning to the mountains, resumed the war, under the command of two chiefs, Ravanel and Roland. Villars pushed the campaign against them vigorously, defeated and captured Ravanel, who was executed next year (1705) at Nîmes. Roland was betrayed and executed 1704. Villars and his successor Berwick succeeded in entirely crushing the revolt. The peasants were disarmed, and the district pacified by certain exemptions from taxation, as compensation for property destroyed.—Frosterus, *Les insurgés protestants sous Louis XIV.* (Paris, 1868); C. V. Noorden, *Spanische Erbfolgekrieg*, I. II. (Düsseldorf, 1870, 1874).

CAMLET, n. *kăm'lĕt* [F. *camelot*—said to be from L. *camēlus*, a camel: mid. L. *camelōtum*, cloth of camel's hair: by some, traced to Arab. *chamal*, fine]: a light and fine texture first made of camel's or goat's hair, now of wool or goat's hair, with silk—of a wavy or watered surface. British camlets are either wholly of wool, or of wool with cotton or linen. CAM'LETED, a. wavy like camlet; veined.

CAMMAS, n. or CAMAS, *kăm'mas*, or QUAMASH, *quawm'-ăsh:* an esculent plant, *Camassia esculenta*, of n.w. America, the bulbs of which are eaten by the natives.

CAMMERHOFF, *kâm'mĕr-hof*, JOHN FREDERIC: 1721, July 28—1751, Apr. 28; b. near Magdeburg in Saxon Prussia: Moravian bishop. He emigrated 1746 to Bethlehem, Penn., as assistant to the presiding bp. of the Moravian Church, and was active in mission work among the Indians, especially the Delawares and the Six Nations. The Oneidas adopted him 1748 as a member of their tribe. He spent four weeks in journeying, by canoe on the Susquehanna, and through the forests, to an Iroquois council at Onondaga, N. Y., 1750: the hardships of this trip destroyed his health. He died at Bethlehem.

CAMMOCK, n. *kăm'mŏk* [AS. *cammoc*]: the plant rest-harrow—so called from the length and toughness of its roots, by which the harrow is arrested; the *Onōnis arven'sis*, ord. *Legumi'nōsæ*.

CAMOENS, *kăm'o-ĕns*, LUIS DE (modern spelling, *Camões*): abt 1524–79; b. Lisbon: the epic poet of Portugal. He studied the ancient classics at Coimbra. On his return to Lisbon, he fell in love with a lady of honor, Catharina d'Atayada—the beginning of all the poet's misfortunes. Having been banished by royal authority to Santarem, C. joined the expedition of John III. against Morocco, and lost his right eye in a naval engagement with the Moors in the Strait of Gibraltar. On his return to Lisbon, his bravery as a soldier was no more honored than his genius as a poet. Disappointed in all his hopes, he determined to leave forever his native land, and sailed for India, 1553. Offended by certain abuses of the Portuguese authorities in India, C. ventured to expose them in a satire, entitled *Disparates na India*, 'Follies in India,' in which he treated even the viceroy with ridicule. For this offense the poet was banished, 1556, to Macao, where he lived several years, and was engaged in writing *Os Lusiadas*. Here C. held the unpoetical but probably lucrative post of administrator of the effects of deceased persons; and having saved, as he thought, a competency for his future life, was recalled from his banishment, 1561. Unhappily, in returning to Goa, he suffered shipwreck, and lost all his property, excepting his epic poem. After other wanderings and misfortunes, C. took ship for Lisbon, where he arrived 1569, with no other wealth but his epic. He dedicated *The Lusiad* to the young king, Sebastian, who was very gracious; but, nevertheless, all the real patronage bestowed on C. consisted of a very small pension (about $20), and permission to remain at the court of Lisbon.

Even this small pittance was taken away after the death of Sebastian, and Camoens was left in such poverty, that a faithful Indian servant begged in the streets of Lisbon for the support of the great epic poet of Portugal. Camoens' lyric poems written during this time of destitution contain many pathetic lamentations. He died obscurely in the hospital of Lisbon; and 16 years afterward, when it was proposed to erect a splendid monument to his memory, there was some difficulty in finding his burial-place.

The Lusiad (*Os Lusiadas*, 'the Lusitanians') celebrates the chief events in the history of Portugal, and is remarkable as the only modern epic poem pervaded by anything like the true national and popular spirit of the ancient epics. It is a gallery of epic pictures, in which all the great achievements of Portuguese heroism are represented. Among the most famous passages are the tragical story of Inez de Castro, and the apparition of the giant Adamastor, who appears as the Spirit of the Storm to Vasco da Gama, when rounding the Cape. The versification of *The Lusiad* is extremely charming. Patriotic sentiments pervade the work. Besides his epic poem, Camoens wrote sonnets, odes, elegies, eclogues, epigrams, satires, epistles, and three comedies—*Os Amphitryoes* (after Plautus), *King Seleucus*, and *Filodemo*. There have been many editions of his works, one of the fullest being by the Viscount de Juromenha, with a good biography (6 vols., Lisb. 1869). Translations of the *Lusiad* have been made into almost all European languages. Mickle's English translation was published 1776; Captain Burton's excellent one (1881) was the ninth English rendering.

CAMOGLIA, *kâ-mōl'yâ:* town of Italy, on the Gulf of Genoa, about 13 m. e.s.e. of the city of Genoa. The chief occupation is fishing. Pop. above 5,000.

CAMOMILE, n: see CHAMOMILE.

CAMONICA, *kâ-mō-nē'ka*, or VALLE CAMONICA, a valley in north Italy, formed by two branches of the Rhætian Alps, watered by the Oglio, and stretching about 50 miles from north-northeast to south-southwest as far as Lake Iseo. It is a principal thoroughfare between Italy and the Tyrol.

CAMORRA, *kâ-mŏr'râ:* a secret society, existing through all parts of the former kingdom of Naples, the members of which are called *Camorristi*, and have exercised lawless force to a great extent over the humbler classes of society. Under the Bourbons, they openly presented themselves at markets, hackney-coach stations, public spectacles, and all occasions of popular amusement; assumed the right of deciding disputes; extorted a portion of whatever money passed from hand to hand for purchases, rents, wages, and the like, or in games; undertook also the transport of smuggled goods, and contracted for the commission of serious crimes. Their readiness for violence and murder, and their close association among themselves, made them so much dreaded, that Camorristi who had

even been thrown into prison succeeded in exacting money from their fellow-prisoners and from the jailer himself. The society has a central rendezvous in every large provincial town, and twelve such in the city of Naples. Those who belong to each of these sections of the society are under the absolute government of a chief elected by themselves, with whom is associated a treasurer. The latter has the charge of the common fund into which all the Camorristi of that section pay their whole gains, for equal distribution among all their associates. Candidates for membership must show that they have neither been guilty of espionage nor theft; also that neither their wives nor their sisters are prostitutes; and must swear upon an iron crucifix a fearful oath of fidelity and secrecy. The candidate remains for a year, with the designation of *Picciotto d'onore*, as a pupil under an old Camorrista; and having completed his probation, and given proof of his courage and obedience in circumstances involving danger of life, he is advanced to the rank of a *Picciotto di sgarro*. Finally, after a longer period, and when he has given proof of his fitness on a number of occasions, he is admitted to full membership of the society as a *Camoorrista*. Each Camorrista carries two knives of peculiar form, by which the members of the society recognize each other. They are held under the strictest discipline. Disobedience is punished by flogging, suspension from employment, or expulsion; treachery, even on the part of a member who has been expelled, is punished with death. If two Camorristi quarrel, their chief decides the question between them; but in difficult cases, a duel with daggers is the mode of decision. Under King Ferdinand II. the Camorra was tolerated for political reasons. The government of Francis II. endeavored to put down the society; and the police received instructions to seize and transport all known members of it. Those who remained entered into an alliance with the Garibaldi committee, and rendered essential service in the expulsion of the Bourbons. An attempt was then made to employ them in the police service, but completely failed. The Camorra having fallen out with the new government, now chiefly live by robbery.

CAMOUFLET, n. *kăm'ô-flā* [F. *camouflet*, smoke of lighted paper]: in *mil.*, a small subterranean countermine containing usually abt. 10 lbs. of powder, made for the purpose of blowing in the enemy's mining galleries and destroying the miners, or cutting off their retreat.

CAMP, *kămp*, WALTER, American writer on athletics: b. New Britain, Conn., 1859, April 7. He was graduated at Yale (1880) and soon attained prominence with such writings as *Book of College Sports; American Football;* etc. He has edited various weekly papers devoted to sports and is well known as an authority upon college athletics and football. He has also written *Football Facts and Figures; Football; Yale, Her Campus Class-room and Athletics; Drives and Puts* (with Lillian Brooks), etc.

CAMP, n. *kămp* [F. *camp*—from L. *campus*, a plain, It. *campo;* Sw. *kamp;* Ger. *kampf*, battle]: the ground occupied by an army at rest, and the tents as arranged on this ground; in *OE.*, a fight; a battle: V. to rest an army in the open country (see ENCAMP): CAMP'ING, imp.: ADJ. fit or suited for a camp. CAMPED, pp. *kămpt*. CAMP-CEILING, a ceiling in which the marginal portion is sloping, following the line of the rafters, while the mid-portion is level. CAMP-FIGHT, the decision of any dispute by combat; a trial by arms. CAMP-FOLLOWER, n. one who follows an army but has not an appointment (see CAMP FOLLOWERS). CAMP-MILL, a mill adapted for the use of an army, to grind grain on the march, or in camp. It is carried on a wagon or running-gears, and is sometimes driven by the wheels in travelling; sometimes by a sweep operated by horses or men after the wheels are anchored or sunk in the ground. CAMP STOOL, a chair whose frame folds up into small compass for convenience of packing or carriage.

CAMP: ground occupied by an army at rest, and the tents, etc., arranged on it. The signification of this word in English is rather that which belonged to the Latin *castrum*, an encampment, or *castra*, a collection of tents, huts, and other structures, for the accommodation and protection of troops, than that which its etymology would more directly indicate. The regular system of encampment ultimately adopted by the Romans was adopted by degrees. The most complete account of it is furnished by Polybius, for an illustration of whose description see a plan in Dr. Smith's *Dictionary of Greek and Roman Antiquities*. When a Roman army was about to encamp, a tribune and several centurions were sent on before, to select a suitable site for the purpose. As soon as the locality was determined, they chose the spot for the pretorium or general's tent, and marked it with a white flag. Around the pretorium, as a sort of centre or heart to the whole system, the rest of the C. was laid out. It was generally placed on an elevated position, in order that the general might have the rest of the encampment under his eye, and be able to transmit his orders with greater facility. Polybius himself tells us, that the best conception which can be formed of a Roman C. of the more permanent kind is by regarding it as a military town: it probably had some resemblance to such modern camps as the English Aldershott (q.v.). The streets were broader than those usual in towns, the wider ones measuring 100, the narrower 50 ft.; and the *forum*, as its name indicates, was a sort of public market-place. A space of 200 ft. was left vacant all round between the tents and the ramparts, partly to afford space for the arrangements of the army, and for stowing away any booty that might be captured, but chiefly to protect the soldiers' huts from incendiary attempts from without. In form, the Roman C. was square, except in the case in which it was intended to embrace within its ramparts four legions, or two consular armies, when it became an oblong rectangle. The C. was surrounded by a fosse or trench (*fossa*), generally 9 ft. deep and 12 broad. On the top of the rampart of earth there

were stakes. The labor of constructing the rampart and the fosse was divided between the allies and the Roman legions, the former making the sides along which they were stationed, and the legions the rest. The task of superintending the construction of the C. among the Romans was intrusted to the tribunes; among the allies, to the prefects. Before the arrival of the troops, the different parts of the C. were so distinctly marked out and measured off, that they at once proceeded to their respective stations, as if they had entered a well-known city, and were marching to their quarters. The discipline of the C. was of the strictest kind. The tribunes administered an oath against theft both to freemen and slaves, and two maniples were chosen to keep the *via principalis*, which was a place of general resort, clean and in good repair. The other occupations connected with the C. were portioned out in like manner; and the superintendence of the whole was intrusted to two tribunes chosen by lot from each legion, and appointed to serve for two months. The prefects of the allies had a similar authority, which, however, seems to have been limited to their own troops. Every morning at daybreak the centurions and horsemen presented themselves to the tribunes, and these, in their turn, received their orders from the consul. The watchword for the night, marked on a four-cornered piece of wood, was given out with much formality. The night was divided into four watches, each of three hours' length; and there was an arrangement for ascertaining that guard was kept with vigilance. The soldiers of the watch companies received from the tribune a number of small tablets, with certain marks upon them, and these tablets were collected during the night by the horsemen whose duty it was to visit the posts, from such of the guards as they found on duty. Where these inspectors found the guards asleep or absent, they called upon the bystanders to witness the fact, and then passed on to the next. In the morning, the inspectors appeared before the tribunes, and gave up the tablets which they had received, when the guards whose tablets were not produced were required to account for them. A regular scale of rewards and punishments was established in the camp. In comparing the encampments of the Romans with those of his own countrymen, Polybius tells us that the Greeks trusted mainly to a judicious selection of their ground, and regarded the natural advantages which they thus secured as supplying in a great measure the place of artificial means of defense. The Greeks, consequently, had no regular form of C., and no fixed places were assigned to the different divisions of the army. When the practice of drawing up the Roman army according to cohorts, introduced by Marius and Cæsar, was adopted, the internal arrangements of the C. experienced a corresponding change. Latterly, even the square form was abandoned, and the C. was made to suit the nature of the ground. It was always held important, however, that the C. occupied a defensible position; that it could not be inspected from a neighboring height; and that it had a command of water.

When stationary camps (*castra stativa*) came into more general use, several parts appeared, not mentioned by Polybius, for instance, the infirmary (*valetudinarium*), the farriery (*veterinarium*), the forge (*fabrica*), etc., and as a great variety of troops then came to be employed, they must have had new stations appointed to them in the camp. Many of the stationary camps ultimately became towns, and to this is ascribed the origin of most of the towns in England the names of which end in *cester* or *chester*. Among the most perfect of those which retained the form of the simple encampment, is that at Ardoch in Strathern, Perthshire, in the grass-covered mounds and ridges of which most of the divisions of the C. have been distinctly traced by antiquaries. See General Roy's *Military Antiquities in Great Britain*, and the *Caledonia Romana* of the late Robert Stuart.

It is believed that, during the middle ages, the plan adopted by the Romans in their camps was more or less adhered to, seeing that the weapons employed, which mainly determined the character of the troops, were nearly the same. In Britain before the arrival of the Romans, also during the Saxon and Danish periods, the camps, usually circular in form, appear to have been somewhat rude, with the cavalry grouped round the standard in the centre, and the infantry placed near the front.

The principles of castrametation, or camp-formation, underwent much change after the invention of gunpowder, owing to the necessity for defending the C. from artillery. For modern camps, of different kinds, see ENCAMPMENT.

CAMPAGNA, *kâm-pân'yâ:* town of Italy, province of Salerno, between high mountains, about 20 m. e. of Salerno. It has a fine cathedral, several convents, and a large annual fair. Pop. 7,000.

CAMPAGNA DI ROMA, *dē rō'mâ:* undulating, uncultivated, and unhealthful plain of Italy surrounding Rome, including the greatest part of ancient *Latium*, and forming the late papal delegation of Frosinone and a great part of the Comarca di Roma. Its length is variously stated, arising from measurements from different points. But supposing the name to apply to the district extending from Cape Linaro, s. of Civita Vecchia, to Terracina, beyond the Pontine marshes, its length is about 90 m.; and its breadth inland, to the Alban and Sabine hills, is stated as 27–40 m. A broad strip of sandy plain skirts the Mediterranean. The ground, nowhere more than 200 ft. above the sea, is almost entirely volcanic, and the lakes are formed by craters of extinct volcanoes. The vapors rising from this district, and especially from the Solfatara (q.v.), produce the pestilential atmosphere styled *Aria Cattiva*. The number of inhabitants is very small, and in summer they are driven from the C. by its pestilent air, and seek shelter in Rome and neighboring places. In autumn, herdsmen descend from the Apennines to the C. with their herds, the pasturage in some parts being rich and abundant. This district was not always uncultivated and depopulated as

we now find it, for Domitian and Hadrian built here their splendid villas. Wars and devastations, the 'black death' (q.v.) in the 14th c., which greatly thinned the population, and inundations from the Tiber, have been the main causes of the present state of the C.; but according to Livy, it was always unhealthful, even when well cultivated. Some of the popes, especially Pius VI., have endeavored to drain the Pontine Marshes, and, during the dominion of the French in Italy, General Miollis made great improvements in drainage, timber-planting, and cultivation in the Campagna.

CAMPAGNOL, n. *kăm-pan'yŏl:* a small species of mouse, called also the Meadow-mouse, *Arvicola arvalis* or *agrestis*, which is very destructive to roots and seeds in fields and gardens.

CAMPAIGN, n. *kăm-pān'* [F. *campagne;* OF. *campaigne*, an open field, country—from mid. L. *campānĭă*, a plain; It. *campagna*, the plain open field]: an extensive tract of country not hilly; the time an army is engaged either in marching, fighting, or in camp. CAMPAIGN'ING, n. serving in a campaign. CAMPAIGN'ER, n. one who. Campaign generally means a connected series of military operations, forming a distinct stage or step in a war. Under the old system of warfare, when armies kept the field only in summer, a C. was understood to include all that was done by an army from the time it took the field till it went again into winter-quarters. Now that winter is no longer allowed to arrest military operations, it is more difficult to say where one C. ends and another begins. Some writers make a C. include all the steps taken to accomplish some one immediate object.

CAMPAN, *kŏng-pŏng'*, JEANNE LOUISE HENRIETTE: 1752, Oct. 6—1822, May 16; b. Paris: reader to the daughters of Louis XV. She was favored by Marie Antoinette, and gave her royal patroness numerous proofs of fidelity. When the unfortunate queen was conveyed to the Temple, she wished to share her captivity, but was refused entrance by Petion. During the Reign of Terror she remained concealed at Combertin. After the fall of Robespierre, she opened a boarding-school at St. Germain-en-Laye, which was patronized by Josephine Beauharnais, who sent her daughter Hortense to it. In 1806, Napoleon appointed her lady-supt. of the Institution at Ecouen for the education of the daughters of the officers of the Legion of Honor. After the restoration, this institution was suppressed, and Madame C. retired to Mantes, where she died. She is remembered chiefly for her interesting works—*Mémoires sur la Vie Privée de la Reine Marie Antoinette* (4 vols., 5th ed., Par. 1824), *Journal Anecdotique* (Par. 1824), and *Correspondance Inédite avec la Reine Hortense* (2 vols., Par. 1835)—giving recollections of the court of Louis XV., of Marie Antoinette, the Revolution, and some traits from the private character of Napoleon.

CAMPANA, LA, *lâ kâm-pâ'nâ:* town of Andalusia, Spain, on the Madre-Viega, tributary of the Guadalquivir,

about 37 m. e.n.e. of Seville. The people are engaged chiefly in agriculture, and in weaving and brick-making. Pop. 4,380.

CAMPANARIO, *kâm-pâ-nâ'rē-o:* town of Estremadura, Spain, about 62 m. e.s.e. of Badajos; an ill-built place, with narrow, uncared-for streets. It has manufactures of linens and ropes, and a trade in the agricultural produce of the neighborhood. Pop. 6,400.

CAMPANELLA, *kâm-pâ-nĕl'lâ,* Tomma'so: 1568–1639; b. Stilo, in Calabria: Dominican monk and philosopher. He studied at Naples and Cosenza. The writings of Telesius first awakened his doubts respecting that pile of artificial dogmas styled the 'scholastic philosophy.' The results of his studies were given in his *Philosophia Sensibus Demonstrata,* etc., (Naples, 1591), which contained a defense of Telesius. According to his view all knowledge is based either upon perception or faith. Philosophy is built on the foundation of perception, religion upon that of faith. His superiority in disputations exposed him to the hatred and false accusations of the monks and schoolmen; he was compelled to flee from Naples to Rome, thence to Florence, Venice, and Bologna. Afterward he returned to Calabria, but having involved himself in a political conspiracy, he was seized and confined in a Neapolitan dungeon for 27 years; tried five times, and tortured seven; accused of heresy; and declared the author of a book which had been published 30 years before he was born. In 1626, Pope Urban VIII. had him brought to the prison of the Inquisition at Rome, but immediately liberated him, and treated him in a very generous manner. After being again persecuted by the Spanish government, C., who had formed the friendship of the French ambassador at Rome, the Duc de Noailles, obtained a letter of introduction to Cardinal Richelieu, and secretly left for France, where he was graciously received. He died in the Dominican monastery of St. Honoré, near Paris. Most of his works—*De Gentilismo non Retinendo* (Paris, 1636), *Astrologicorum Libri VII.* (Lyon, 1629), *Prodromus Philosophiæ Instaurandæ* (Frankfort, 1617), *Exordium Metaphysicæ Novæ, De Sensu Rerum et Magia* (Frankfort, 1620)—were written during his imprisonment. The patronage of the pope was gained, not by C.'s speculative works, but by several writings in defense of the Rom. Cath. Church. His *De Monarchia Hispanica Discursus* is a work of great power and value, comprising a sketch of the political world of his time, with special reference to Spain. It was translated into English during Cromwell's protectorate.

CAMPANHA, *kâm-pân'yâ:* town of Brazil, about 150 m. n.w. of Rio de Janeiro, surrounded by bare hills, much cut up by gold mines. The houses are built chiefly of earth, and surrounded by gardens. Campanha has several churches, a Latin school, hospital, theatre, etc. Pop. 6,000.

CAMPANIA, *kâm-pân'yâ:* anciently a province of central Italy, having Capua as its capital (now subdivided into the provinces of Benevento, Naples, Salerno, Avellino, and Caserta); was bounded on the s. by Lucania, e. by Samnium, n. by Latium, and w. by the Tyrrhenian Sea. It was one of the most productive plains in the world, producing in extraordinary abundance corn, wine, and oil; and both by Greek and by Roman writers is celebrated for its soft and genial climate, its landscapes, and its harbors. It was the *regio felix* of the Romans, who built here many of their most splendid villas, etc. Through it passed the Appian Way, greatest high-road of Italy. The promontory Misenum, Mount Vesuvius, the river Vulturnus, the towns Baiæ, Cumæ, Linternum, Puteoli, Naples, Herculaneum, Pompeii, Nola, Salernum, Capua, etc., belonged to Campania. It was the oldest Greek settlement in Italy, having been colonized, according to the later chronologers, about B.C. 1050; but this date is probably too early. It was next conquered by the Etruscans, and several of the towns above mentioned, such as Capua and Nola, were founded by that people. The Etruscans then succumbed to the more warlike and hardy Samnites, who, in their turn, yielded to the irresistible valor of Rome (B.C. 340). Through all these vicissitudes of conquest the substratum of the people remained as at the beginning. The mass of the Campanians were essentially of Oscan race, and Oscan they remained. Indeed, it is mainly from them that our knowledge of the Oscan language is derived, and one of their towns—Atella, between Capua and Naples—had the honor of introducing upon the early Roman stage a species of popular drama or comedy, greatly relished for its quaint and vigorous humor: see ATELLANÆ.

CAMPANIFORM, *kăm-păn'ĭ-fawrm*, or CAMPANIL'IFORM, *-ĭl'ĭ-fawrm*, a.: bell-shaped; an epithet applied to flowers which resemble a bell in shape.

CAMPANILE, n. *kăm'pă-nīl* or *kăm'pă-nē'lā* [It. *campanile*, a campanile—from mid. L. *campāna*, a bell]: bell-tower of the larger kind, usually detached from the church. Scarcely any of the existing bell-towers of England and the United States answer to the Italian conception of the C., but it is said that there was a very fine one at Salisbury, England, 200 ft. in height, destroyed by Wyatt. In Italy they are very numerous: perhaps the most remarkable are the so-called 'leaning tower' of Pisa, and the C. of Florence. The former, circular in form, is decorated with columns and arcades to the summit of its eight stories, and presents a very imposing appearance, reminding the traveller of the Coliseum at Rome, from which, and the now destroyed Septizonium, the idea of it is said to have been taken by the architects Bonano of Pisa, and Wilhelm of Innsbruck. But though less curious, the famous C. of Giotto is perhaps even more worthy of note. It was erected, 1334, with the express object of surpassing, both in height and in richness of workmanship, any of the remains of antiquity. In form it is a paral-

lelopiped, and is of the same dimensions from bottom to top. Though it is very lofty—267 ft.—it consists of only four stories, of which the tallest are the uppermost and undermost; and the windows in the upper story are rather larger than those in the two beneath, the object being to counteract the diminution to the eye occasioned by the greater distance. The original design of Giotto was that a spire of 100 braccia in height should surmount the present structure, and on the summit may be seen the four great piers whence it was to have risen. The splendid C. of Florence, in its present condition, must thus be regarded as only a fragment. (There is a fine C. at Seville, 350 ft. in height, built by Guever the Moor, 1568. It is called La Giralda, from a brazen figure, which, though it weighs a ton and a half, turns with the wind.) The famous C. of St. Mark's, Venice, 325 ft. high, erected 888 A.D., fell to the ground 1902, July 14, crushing with it the Sausovine Loggia. The municipal authorities at once took steps for its restoration.

CAMPANINI, *kâm-pa-nē'nē*, ITALO, Italian singer: b. Parma, 1846, June 29; d. 1896, Nov. 23. His father was a blacksmith. At 14 the boy enlisted in Garibaldi's army and served in two campaigns, after which he worked at his father's trade until the age of 18. Meanwhile, having shown that he possessed an excellent voice, he had taken singing lessons, and after spending a year at the Conservatory in Parma, he appeared in that city as the notary in *La Sonnambula*, but suffered failure and ridicule. He still continued to sing in public, and in 1869 began to study under Lamperti, a celebrated teacher of Milan. In that city, at La Scala, he sang in *Faust*, and immediately was acclaimed a great tenor. He appeared in London in 1872, and in the following year made his first visit to the United States, appearing with Nilsson at the Academy of Music, New York, in *Lucrezia Borgia*. Afterward, in this country and Europe, he sang with great success, and was regarded as the foremost tenor of his time. The partial failure of his voice, mainly through an affection of the throat, caused some interruption of his career, but scarcely diminished his popularity until near the close of his life.

CAMPANOLOGY, n. *kăm'pă-nŏl'ŏ-jĭ* [mid. L. *campāna*, a bell: Gr. *logos*, a discourse]: the art of ringing bells, or a treatise on the art. CAMPANOL'OGIST, n. *-ŏ-jĭst*, one skilled in the art of ringing bells; a writer on.

CAMPANULA, n. *kăm-păn'ū-lă* [mid. L. *campan'ŭlă*, a little bell—from *campāna*, a bell: It. *campan'ella*]: a genus of plants bearing bell-shaped flowers; the bell-flower. CAMPAN'ULATE, a. *-ū-lāt*, in *bot.*, bell-shaped, as the *harebell*.

CAMPANULA: genus of plants of the nat. ord. *Campanulaceæ*, distinguished by a bell-shaped corolla, with five broad short segments, filaments dilated at the base, a 2–5-cleft stigma, and a top-shaped capsule with 2–5 cells, opening by lateral clefts below the calyx seg-

ments. The species are very numerous, abounding chiefly but not exclusively in the northern parts of the world, and the more elevated districts of the temperate zones. They are mostly herbaceous, some of them annual. The name Bell Flower, common to many of them, is often extended to all. The flowers are in general beautiful, and many species are frequent ornaments of flower-borders. One of the most common and beautiful is the Harebell (q.v.) or Bluebell (*C. rotundifolia*). The Canterbury Bell (*C. Medium*) is a beautiful annual, also very common; native of the central parts of Europe.—Medicinal virtues were formerly ascribed to some species, particularly in affections of the throat, wherefore *C. Trachelium*, frequent in woods in England, has received the name of Throatwort; but they are now regarded as inert.—The roots of some are reckoned among esculents, as those of the Rampion (q.v.), (*C. Rapunculus*), cultivated in some parts of continental Europe.

CAMPANULACEÆ, *kăm-păn-ū-lā'sē-ē:* nat. ord. of exogenous plants, herbaceous or half shrubby, with a bitter milky juice; leaves without stipules, and generally alternate; the calyx usually 5–lobed, its tube adhering to the ovary; the corolla monopetalous, inserted into the top of the calyx, usually 5–lobed and regular; the stamens inserted into the calyx, and alternate with the lobes of the corolla, the fruit with two or more many-seeded cells, crowned with the withered calyx and corolla, and opening by division of the cells (*lorulicidally*); the seeds fixed to the axis, and having fleshy albumen. About 500 species are known, natives chiefly of the temperate and colder climates of the n. hemisphere, where their blue or white flowers are among the finest ornaments of fields and woods. The roots and young leaves of some species are eatable, as is the half-fleshy fruit of *Canarina Campanula*, native of the Canary Islands.

CAMPANULARIANS, or Sertularians, hydroids of the order *Campanulariæ*. They are always colonial and possess hydrothecæ, and in most cases give rise to a medusa, with auditory organs on the flaps. The ectoderm is protected by a horny or chitinous sheath (perisarc) enveloping the zooids. The hydroids retract, when disturbed, into small cells (hydrothecæ), arranged in opposite rows on the stalk as in *Sertularia*, or singly at the ends of the stalks, as in *Campanularia*, while the sheaths (gonothecæ) protecting the medusa-buds are distinguished by their much larger size and cupshaped form. The Sertularians abound on seaweeds, and may be recognized from their resemblance to mosses. The medusæ of these and many other hydroids can be collected by a towing-net, and emptied into a jar, where they can be detected by the naked eye after a little practice. It is possible that the extinct palæozoic group, *Graptolites*, belong near the Campanularians, as they have a similar perisarc composed of cells (hydrothecæ). Consult: A. Agassiz *North*

American Acalephæ (Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College, No. 2, Cambridge 1865); E. C. and A. Agassiz, *Seaside Studies in Natural History* (Boston 1871); Nutting, *American Hydroids* (*Special Bulletin of the U. S. National Museum* Washington, 1900), contains a full bibliography.

CAMPARDON, Emile, *ā-mēl kân-pâr-dôn,* French writer: b. Paris, 1834. He was educated at the Ecole des Chartes, and then had charge of the archives there. In this position he had opportunity to examine the documents relating to the 18th century and the period of the French Revolution. He has written: *History of the Revolutionary Tribunal of Paris* (1861); *Marie Antoinette at the Conciergerie* (1862); *Madame Pompadour and the Court of Louis XV.* (1867); *Unpublished Documents of J. B. Poquelin Molière; Voltaire, Unpublished Documents; The Royal Academy of Music in the 18th Century;* and *Memoirs of Frederic II., King of Prussia* (with E. Boutaric).

CAMPBELL, *kăm'el* or *kăm'bel:* family name of the Lords of Argyle. The origin of the family has not been ascertained. One theory makes it of Anglo-Norman origin; another traces its descent through a long line of Celtic chiefs to King Arthur. It first appears in record toward the end of the 13th c., when it held lands in Ayrshire and Argyle. For the chiefs of the family that have been most distinguished in public affairs, see Argyle.

CAMPBELL, *kăm'el* or *kăm'bel,* Alexander, d.d.: 1786 June—1866, Mar. 4: founder of the 'Disciples of Christ,' otherwise known as 'Christians' or 'Campbellites;' b. co. Antrim, Ireland; son of a Presb. minister, who was a relative and namesake of Thomas Campbell the poet. He was educated at the Univ. of Glasgow, followed his father to America, 1809, and preached in Washington co., Penn., near Bethany, Va., his later residence. He and his father formed an independent society at Brush Run, Penn., 1810. Campbell adopted Baptist views and usages 1812, but still objected to human creeds, regarding the Bible as a sufficient rule of faith. Excluded from Baptist communion, C. and his followers organized, 1827. He began, 1823, to publish the *Christian Baptist,* changed, 1829, to the *Millennial Harbinger.* He founded Bethany College, 1840, and held its presidency till his death. Before that event his sect had 350,000 members, chiefly in Va., Ky., and Tenn.; it has since spread in the western states. See Disciples. Campbell published sundry debates, hymn-books, theological works, and a translation of the New Testament, in all, 52 vols. He had 'an acute, vigorous mind, quick perceptions, and rapid powers of combination.' He died Bethany, W. Va. His life was written by R. Richardson, 2 vols. 1868.

CAMPBELL, Alexander, American politician: b. Concord, Pa., 1814, Oct. 4; d. La Salle, Ill., 1898 Aug. 9. He received a common-school education and entered the iron business, removing to Illinois and attaining prominence

in local politics. He was mayor of La Salle, Ill., in 1852, a member of the Illinois legislature in 1858 and a member of Congress in 1875. He was widely known as the 'father of the Greenback party.'

CAMPBELL, Sir Alexander, Canadian statesman: b. Yorkshire, England 1822, March 9; d. Toronto, 1892, May 24. He began the practice of law in 1843, and in 1856 became queen's counsel. In 1858 he entered the legislative council, and in 1862 was elected speaker. In 1864–7 he was commissioner of Crown Lands. He was a member of the Quebec Conference in 1864, received an appointment to the Dominion senate (1867), where he was the government leader; became a member of the Queen's Privy Council in 1897, and was postmaster-general in Sir John Macdonald's first federal cabinet. In 1873 he became minister of the interior. With the other cabinet officers, he resigned in the same year, because of the Pacific Railroad scandal. On the return of Macdonald to power, he was minister of militia and defense and again postmaster-general. In 1881 he was minister of justice, and in 1887 lieutenant-governor of Ontario. In politics he was a Conservative, and represented Canada in the imperial federation conference held at London in 1887.

CAMPBELL, Allan, American civil engineer: b. Albany, N. Y., 1815; d. New York 1894, March 18. He laid out the route of the New York and Harlem R.R.; built a railroad from Callao to Lima, Peru (1855); was appointed engineer of the harbor defenses of New York in the early part of the Civil War; was chief engineer in the construction of the Union P. R.R. He superintended the Harlem R.R. improvement, and became commissioner of public works in New York (1876).

CAMPBELL, Archibald (8th Earl and 1st Marquis of Argyle): b. 1598; d. 1661. He was a zealous partisan of the Covenanters. Charles I. created him a marquis in 1641, notwithstanding the opposition he had shown to his favorite object of effecting a conformity between the churches of Scotland and England. It was by his persuasion that Charles II. visited Scotland, and was crowned at Scone in 1651. At the Restoration he was confined in the Tower for five months, and was then sent to Scotland, where he was tried for high treason in connection with the death of Charles I., and beheaded.

CAMPBELL, Archibald (9th Earl of argyle): d. 1685, June 30. He was the son of the 8th Earl of Argyle, and served the king with great bravery at the battle of Dunbar, and was excluded from the general pardon by Cromwell in 1654, for his exertions in favor of the royal cause. He was afterward made a privy-councilor and one of the lords of the treasury. For refusal to take contradictory oaths, he was tried for treason, and condemned to death, but escaped to Holland, whence he returned with several other disaffected persons, and landed in the High-

lands, with a view of aiding the insurrection of the Duke of Monmouth. The plan, however, failed; and he was taken by some country people, who conveyed him to Edinburgh, where he was beheaded.

CAMPBELL, Bartley, American dramatist: b. Allegheny City, Pa., 1843, Aug. 12; d. Middletown, N. Y., 1888, July 30. He engaged in journalism early in his career and established the *Evening Mail* in Pittsburg (1868) and the *Southern Magazine* in New Orleans (1869). His first drama that met with success in New York was *My Partner*, appearing in 1879. *Fairfax, or Life in the Sunny South*, and *The Galley Slave*, were on the metropolitan boards during the same season. Included in his plays are: *Matrimony; The White Slave; Siberia;* and *Paquita*. Several of his plays were brought out in England.

CAMPBELL, Beatrice Stella Tanner (Mrs. Patrick Campbell), English actress: b. London, 1867; married in 1884 Patrick Campbell, killed in 1900 in the Boer war. Her first appearance on the professional stage was made in 1888 at the Alexandra Theatre in Liverpool. She has been particularly successful in such plays as *The Second Mrs. Tanqueray*, *John-a-Dreams*, and *The Notorious Mrs. Ebbsmith*. She has also appeared in such Shakespearean rôles as Juliet, Ophelia and Lady Macbeth. She has frequently visited the United States, playing in most of the leading cities.

CAMPBELL, Charles, American historian: b. Petersburg, Va., 1807, May 1.; d. Staunton, Va., 1876, July 11. His life was mainly spent in teaching in his native city. Among his publications are: *The Bland Papers* (1840–3); *An Introduction to the History of the Colony and Ancient Dominion of Virginia* (1849); *Genealogy of the Spotswood Family* (1868). He belonged to the Historical Society of Virginia; was a contributor of the *Historical Register* and the *Southern Literary Messenger;* and editor of the *Orderly Book* of Gen. Andrew Lewis in 1776 (1860).

CAMPBELL, Sir Colin, Lord Clyde: 1792–1863, Aug.; b. Glasgow: distinguished British general. His father was a cabinet-maker, named John Macliver, but Colin assumed the name of Campbell to gratify an uncle on the mother's side. He entered the army as an ensign, 1808; fought through the war in the Spanish peninsula with distinction, and took part in the expedition to the United States, 1814. In 1842 he attained the rank of col., and in the same year he was in the attack on Chusan, in China. He next served in the Punjab, commanding the left at the battle of Chillianwallah, and receiving for his conduct the highest praise. He next commanded in the Peshawur district with uniform success against the hill-tribes. On the breaking out of the Crimean war, 1854, he was appointed to command the Highland Brigade, and was prominent in the battle of the Alma; and afterward at Balaklava, where, with the 93d Highlanders, which he did not even form into square, he beat back the Russian

cavalry, who were swooping down on the port, with its accumulation of shipping and stores. His services in this war were rewarded with promotion to the rank of maj.-gen., and he was also created a knight grand cross of the Order of the Bath, and received the cross of the French Legion of Honor. He was appointed inspector-gen. of infantry, and, 1857, commander of the forces in India. then engaged in quelling the Indian mutiny, which by his energy and judgment was soon utterly subdued. A notable characteristic of Campbell's generalship was his care for the lives of his men, all his victories being won with the minimum expenditure of the blood of his soldiers. In 1858 Campbell was created a peer, with the title of Baron Clyde, and appointed a general, the East India Company granting him an annuity of £2,000. Campbell arrived in Britain from India, 1860. See his *Life* by Shadwell (1881).

CAMPBELL, Colin, Scottish clergyman: b. Campbelltown, Argylshire, 1848. He was educated at the universities of Edinburgh and Heidelberg, entered the ministry of the Established Kirk of Scotland, and has been minister of the parish of Dundee from 1882. He preached nearly every year from 1883 to 1900 before Queen Victoria at Balmoral Castle and Crathie Parish Church, and has published *The First Three Gospels in Greek; Critical Studies in St. Luke's Gospel* (1891).

CAMPBELL, Lady Colin, English writer. She is a daughter of Edmond Blood of County Clare, Ireland, and was married to Lord Colin Campbell, youngest son of the 8th Duke of Argyle. She became a widow in 1895. Besides many contributions to journalism, she has published *Darell Blake; A Book of the Running Brook; A Miracle in Rabbits.*

CAMPBELL, Douglass, American lawyer and writer, son of W. W. Campbell (q.v.): b. Cooperstown, N. Y., 1840, July 13; d. Schenectady, N. Y., 1893, March 7. He practiced law in New York (1865–90), but devoted his latest years to historical research. He was the author of *The Puritan in Holland, England, and America* (1892), which has been widely read.

CAMPBELL, Douglas Houghton, American educator: b. Detroit, Mich., 1859, Dec. 16. He was graduated at the University of Michigan in 1882, and then studied in Europe for four years. Returning, he was professor of botany in the University of Indiana till 1891, when he was called to the similar chair in Stanford University. He is author of *Elements of Structural and Systematic Botany* (1890); *Structure and Development of Mosses and Ferns* (1895); *Lectures on Evolution of Plants* (1899); *A University Text-book of Botany* (1902); etc.

CAMPBELL, George, d.d.; 1719–1796, Apr. 6; b. Aberdeen, Scotland: Presb. theologian. He was educated for the law, but turned to the study of divinity. In 1746 he was ordained minister of Banchory Ternan, a parish

some m. s.w. of Aberdeen; and in 1759 he was appointed principal of Marischal College. His first work was his famous *Treatise on Miracles*, in answer to Hume, speedily translated into French, Dutch, and German; exceedingly acute and valuable as the dispute then stood, though not fitted to the changed line of attack on miracles in the present generation. In 1771, Campbell was elected prof. of divinity in Marischal College. In 1776, he published his *Philosophy of Rhetoric*, still a standard work; and later, a *Translation of the Gospels, with Preliminary Dissertations and Notes*. After his death appeared his *Lectures on Ecclesiastical History*.

CAMPBELL, Sir George, English statesman: b. 1824; d. London, 1892, Feb. 18. He was educated at Haileybury for the East Indian service and held several important posts under the Indian government, serving several terms in Parliament also. He published: *Modern India* (1852); *India as It May Be; Handy Book of the Eastern Question* (1876); *White and Black in the United States; The British Empire* (1889).

CAMPBELL, Harry, English physician: b. Margaretting, Essex, England. He studied medicine at Saint Bartholomew's Hospital College and was appointed to the staff of Northwest London Hospital, 1886, and that of Welbeck Street Hospital, 1896. He has published: *The Physiology of Eyesight* (1885); *The Causation of Disease* (1889): *Flushing and Morbid Blushing* (1890); *Differences in the Nervous Organization of Man and Woman* (1891); *Headache and Other Morbid Cephalic Sensations* (1894); *Respiratory Exercises in the Treatment of Disease* (1898), etc.

CAMPBELL, Helen Stuart, American author, b. Lockport, N. Y., 1839, July 4. She was educated at Mrs. Cook's Seminary, Bloomfield, N. J., 1850–8, and very early began contributing to periodicals. From 1881 to 1884, she edited 'Our Continent' (Philadelphia). Her especial interest has been in social and domestic questions, such as the condition of the poor, household management, etc., and her writings for the most part consist of essays and stories illustrating these topics. Chief among them are: *The Ainslee Series* (1864–7); *Six Sinners* (1878); *Unto the Third and Fourth Generation* (1880); *Under Green Apple Boughs* (1881); *The Easiest Way in Housekeeping and Cooking* (1881); *The Problem of the Poor* (1882); *Mrs. Herndon's Income: a Novel* (1885); *Prisoners of Poverty* (1887); *Prisoners of Poverty Abroad* (1889); *Roger Berkeley's Probation* (1891); *Anne Bradstreet and Her Time* (1892); *Women Wage-Earners* (1893); *In Foreign Kitchens* (1894); *Some Passages in the Practice of Dr. Martha Scarborough* (1893); *Ballantyne: a Novel* (1901); etc.

CAMPBELL, Henry Donald, American scientist: b. Lexington, Va., 1862, July 29. He was graduated at Washington and Lee University in 1882; later studied at Berlin and Heidelberg and in 1887 became professor of geology and biology at Washington and Lee University.

CAMPBELL, James Edwin, American politician: b. Middletown, Ohio, 1843, July 7. After an academic education he was admitted to the bar. During the Civil War he served for a time in the navy and was with the Mississippi and Red River flotillas. He was a Democratic member of Congress, 1883–9; governor of Ohio, 1890–2. He was defeated for re-election by William McKinley, afterward President of the United States. In 1895 he was again a candidate, but was defeated by A. S. Bushnell.

CAMPBELL, James M., Scottish-American clergyman: b. Scotland, 1840, May 5. He received his education at the universities of Edinburgh and Glasgow and in 1874 came to the United States. He has lectured much on religious themes and has published: *Unto the Uttermost* (1889); *The Indwelling Christ* (1895); *After Pentecost, What?* (1897); *The Teachings of the Books* (1899); *Clerical Types* (1900); *Bible Questions* (1900); *Typical Elders and Deacons;* etc.

CAMPBELL, James Valentine, American jurist: b. Buffalo, N. Y., 1823, Feb. 25; d. Detroit, Mich., 1890, March 26. When three years old he accompanied his parents to Detroit. He graduated at St. Paul's College, L. I., in 1841; was admitted to the Detroit bar, 1844; practiced with success until 1857. He was then elected a judge of the supreme court of Michigan, re-elected at every succeeding election, and was chosen chief justice for nine terms in succession. From 1859 he lectured for 20 years in the law department of the University of Michigan. Much of his leisure was devoted to literary and historical studies, especially the history of Michigan and the northwest territory. Until 1854 he was a Whig, but thereafter acted chiefly with the Republicans. He wrote *Outlines of the Political History of Michigan* (1876).

CAMPBELL, John, American editor: b. Scotland, 1653; d. 1728, March 4. He was one of a family or kin of Boston booksellers and public officials whose relationships are not terminable, but which included John, in the middle of the 17th century, Duncan, postmaster of Boston from 1694 on, and John (above), who was appointed postmaster—probably succeeding Duncan—in the latter part of 1702. There seems to have been a Thomas also about this time. The later John as postmaster was the news centre of the New England provinces; and in 1703 was writing 'news letters' of European news to Gov. Winthrop of Connecticut, and perhaps other governors, made up of information received from arriving travelers, etc., with inferences as to New England policy. In 1704 he concluded to make these public and for sale; and on 24 April issued the first newspaper in America, the Boston *News Letter,* which he edited till 1722. In 1719 he was deprived of the postmastership. He was justice of the peace for Suffolk County for some years.

CAMPBELL, John (2d Duke of Argyle and Duke of Greenwich), British general and statesman: b. Scotland, 1678; d. 1743. In 1706 he served under the Duke

of Marlborough, and was a brigadier-general at the battle of Ramilles. He was a promoter of the union, for which he incurred considerable odium in his own country. He commanded at the battles of Oudenarde and Malplaquet and assisted at the sieges of Lisle and Ghent. For these services he was made a Knight of the Garter in 1710, and the year following was sent as ambassador to Charles III. of Spain. He was also appointed commander-in-chief of the English forces there. In 1712 he had the military command in Scotland, of which post he was soon after deprived for opposing the court measures; but on the accession of George (I. he was restored, and received additional honors. In 1715 he engaged the Earl of Mar's army at Dunblane, and forced the Pretender to quit the kingdom. In 1718 he was created an English peer with the title of Duke of Greenwich. He filled successively several high offices, of which he was deprived for his opposition to Sir Robert Walpole, but on the removal of that minister he was replaced. In Westminster Abbey, where he was buried, is a noble monument to his memory.

CAMPBELL, John, British historian: b. Edinburgh, 1708, March 8; d. 1775, Dec. 28. His writings before 1742 were published anonymously. From 1755 to the close of his life he was agent of the British government for the province of Georgia. Among his works are: *A Concise History of Spanish America* (1741); *Lives of the English Admirals* (1744); *A Survey of the Present State of Europe* (1750); and *Trade of Great Britain to America* (1772).

CAMPBELL, John (Campbell), Lord High Chancellor of England: 1779–1861, June; b. in the co. of Fife, Scotland; son of a minister of Cupar. He was intended for his father's profession, and was sent, while a mere boy, to the neighboring Univ. of St. Andrews. Campbell himself had no inclination for a clerical life, and when he had completed his studies in the faculty of arts, he left for London, being then about 19 years of age. He obtained employment on the staff of the *Morning Chronicle*, where, in due time, he was intrusted with the care of the theatrical criticism and the reports in the house of commons. He was called to the bar 1806. His sound sense, unpretending activity, and devotion to business were rewarded with an extensive common-law practice, and, after a time, with professional promotion. The silk-gown of a king's counsel was conferred upon him 1827. Three years afterward, he entered parliament, actuated, he writes in the preface to one of his works, by a desire to obtain for England the benefits of a national registry of titles to land. The effort at the time was unavailing, as the landlords, whom it was aimed immediately to benefit, completely misunderstood the purport of the project. Campbell was promoted by the whig party, to which he had attached himself, to the solicitor-generalship 1832, and to the attorney-generalship 1834. In the same year he was chosen

to parliament for Edinburgh, and continued till 1841, remaining in the office of attorney-gen. during nearly all that period. In 1841, he was made chancellor of Ireland and a peer of the United Kingdom; but held the office of chancellor only a few months, while the Melbourne cabinet were in office. For the first time since boyhood, he found himself without regular daily labor, and at the mature age of 60, set to work to win the literary fame which he professes always to have secretly coveted. His first publication was a collection of his speeches at the bar and in the house of commons. For three or four years after the publication of his speeches, Campbell was engaged in the preparation of the *Lives of the Chancellors*, the first series of which appeared 1845. In 1846, he joined the Russell cabinet in the capacity of chancellor of the duchy of Lancaster. His ministerial duties were not sufficiently arduous to interrupt his literary labors, and he proceeded to complete the *Lives of the Chancellors*, and to publish a supplemental series of *Lives of the Chief-Justices of England*. Both works have had great popularity, but leave no doubt that the author was more fitted for a practical lawyer than for a man of letters. Campbell was appointed chief-justice 1850. He held the office for nine years, at the end of which time he received the highest honor of his profession, being made high chancellor. See his *Life* (with autobiography and letters), edited by his daughter (1881).

CAMPBELL, John, Canadian Presbyterian clergyman: b. Edinburgh, Scotland 1840, June 18. He was educated in the University of Toronto, and New College, Edinburgh, and in 1868 became pastor of the Charles Street Church in Toronto. In 1873 he was appointed professor of Church history and apologetics in the Presbyterian College, Montreal. Twenty years later he was convicted of heresy by the Montreal Presbytery, but the decision was reversed by the synod. He has published *The Hittites: Their Inscriptions and Their History* (1890).

CAMPBELL, John Archibald, American lawyer: b. Washington, Ga., 1811, June 24; d. Baltimore, 1889, March 12. He was graduated from the Georgia University in 1826 and was admitted to the bar in 1829 before coming of age, by virtue of a special act of the legislature. Removing to Alabama he soon became prominent in his profession, and in 1853 was appointed associate justice of the supreme court of the United States, resigning in 1861. He was subsequently appointed Confederate secretary of war, and was one of the commissioners named by President Davis to meet President Lincoln and Secretary Seward at the conference in Fortress Monroe in February 1865. He was imprisoned for some months after the close of the Civil War and on his release resumed his legal practice.

CAMPBELL, John Francis, Scotch folklore writer: b. 1822, Dec. 29; d. Cannes, France, 1885, Feb. 17. His

first success was *Popular Tales of the West Highlands* (1860–2), an accurate and discriminating compilation; to which succeeded *Frost and Fire* (1865).

CAMPBELL, John Lorne, American Baptist clergyman; b. Dominionville, Ontario 1845, Jan. 14. He was graduated from Woodstock College, Ontario, and from the Baptist Theological Seminary of the same institution, and subsequently from Toronto University. He was ordained to the Baptist ministry in 1868. Since 1889 he has been pastor of the Lexington Avenue Baptist Church in New York. He has published *Heavenly Recognition and Other Sermons* (1895); *Sanctification* (1901); etc.

CAMPBELL, John McLeod, Scotch theologian: b. Kilninver, Argyle, 1800, May 4; d. 1872, Feb. 27. Sent to Glasgow University at 11, he was licensed to preach by the presbytery of Lorne in 1821. His views on salvation and the atonement brought upon him a charge of heresy, which led to his deposition in 1831. For years he labored in the Highlands and preached without remuneration. When his health broke down he advised his people to attach themselves to the church of Norman Macleod. He spent the remainder of his life in retirement. In 1868 his university gave him the degree of D.D., and in 1871 a testimonial and address was presented to him by men of nearly every religious denomination in Scotland. He wrote: *Christ the Bread of Life* (1851); *The Nature of the Atonement* (1856); and *Thoughts on Revelation* (1862).

CAMPBELL, John Pendleton, American scientist: b. Cumberland, Md., 1863, Nov. 20. He studied at Johns Hopkins University, and in 1888 became professor of biology at the University of Georgia.

CAMPBELL, John Preston, American lawyer and author: b. Boston, Mass., 1849, April 8. He practised law at Abilene, Kansas, but since 1897 has lived in Washington, D. C. Among his numerous writings are: *Merl of Medevon and Other Prose Writings* (1888); *My Mate Immortal;* and *Queen Sylvia and Other Poems* (1886).

CAMPBELL, John TenBrook, American scientist: b. Montezuma, Ind., 1833, May 21. A carpenter in early life, he enlisted as a private at the outbreak of the Civil War, and rose to the rank of captain. He studied engineering and physical science, and has perfected many surveying implements. He has written *National Finances* and pamphlets on mathematical science and astro-physics.

CAMPBELL, Lewis, British classical scholar: b. Edinburgh, 1830, Sep. 3. He received his early education at Edinburgh Academy, and afterward attended the University of Glasgow, and Trinity and Balliol colleges, Oxford, taking the degree of B.A. (with first-class honors in classics) in 1853, and that of M.A. in 1856. Ordained in 1857, he became vicor of Milford, Hants, in the following year a post which he held till his appointment, in 1863, as professor of Greek in St. Andrew's University. He retired

from this chair in 1892, becoming emeritus professor. The 1894–5 series of Gifford Lectures at St. Andrews was delivered by him. As a writer he is known mainly by his editions and translations of ancient Greek authors, the chief of which are: *Plato's Theætetus* (1861); *Plato's Sophistes and Politicus* (1867); *Sophocles—The Plays and Fragments* (1879); *Sophocles in English Verse* (1873–83); *Æschylus in English Verse* (1890); and *Plato's Republic* (with the late Benjamin Jowett 1894). *The Christian Ideal,* published in 1877, is a volume of sermons; and his other works include a *Guide to Greek Tragedy* (1891); *Life of James Clerk Maxwell* (with W. Garnett 1882); *Life of Benjamin Jowett* (with E. Abbott 1897); *Religion in Greek Literature* (1898), the substance of his Gifford Lectures; the articles, *Plato* and *Sophocles* in the ninth edition of the 'Encyclopedia Britannica', and *Jowett* in the supplement to same; *The Nationalization of the Old English Universities* (1900); *Plato's Republic* in Murray's *Home and School Library* (1902); etc. He has also edited Campbell's *Poems* (1904); *Tragic Drama in Æschylus, Sophocles and Shakespeare* (1904); etc.

CAMPBELL, Loomis J., American philologist: b. Oneonta, N. Y., 1831; d. there 1896, Nov. 6. He was author of a *United States History,* also of the popular *Franklin Series* of school books; and edited a *Young Folks' Book of Poetry* and a *Hand-Book of Synonyms.*

CAMPBELL, Mrs. Patrick. See Campbell, Beatrice.

CAMPBELL, Reginald John, English Congregational clergyman: b. London, 1867. After receiving a collegiate training at University College, Nottingham, and Christ Church College, Oxford, he entered the Congregational ministry in 1895. He was pastor of the Union Church, Brighton, became minister of City Temple, London, 1903. and is widely known as a preacher. He has published *The Making of an Apostle; The Restored Innocence* (1898); *A Faith for To-day* (1900).

CAMPBELL, Thomas, British poet: b. Glasgow 1777, July 27; d. Boulogne, France, 1844, June 15. He was educated at the University of Glasgow, where he distinguished himself by the excellence of his poetical translations from the Greek. After leaving the university he resided for a short time in Edinburgh; and all at once attained the zenith of his fame by publishing, in 1799, *The Pleasures of Hope.* It produced an extraordinary sensation, and soon became a familiar book throughout the kingdom. This was due not more to the graces of its style than to the noble purity of its thoughts. After the publication of this he went to Germany, where he met Klopstock at Hamburg, and visited the scene of the battle celebrated in *Hohenlinden,* one of the most famous of his poems. The appearance of the English fleet caused him to leave Altona, where he had resided for some time. During this tour several of his best lyrics were written or suggested, among them *The Exile of Erin, Ye Mariners*

of England, and *The Battle of the Baltic*. In 1803 a new edition of *The Pleasures of Hope*, with other poems, appeared, and in that year he was married. Settling in London he devoted himself to literary work, and in 1805 obtained a pension of £200, through the influence of Fox, of whose politics he was an admirer. After this he appears for a time to have given his attention less to poetry than prose, but in 1809 he again made his appearance as a poet, and published *Gertrude of Wyoming*, which some eminent critics have considered superior to *The Pleasures of Hope*, though the public appear to have judged differently. In 1814 he visited Paris, and in the following year he received a legacy of over £4,000. In 1819, by his *Specimens of the British Poets*, accompanied with critical essays, he proved himself the possessor of great critical acumen and an admirable prose style. In 1820 he became editor of the *New Monthly Magazine*, a position which he held till 1830. In 1824 he published *Theodoric*, which, though not devoid of fine passages, scarcely sustained his reputation. For some years he took an active interest in the emancipation of Greece and Poland, and in the foundation of the London University, of which he considered himself the originator. He was lord rector of the University of Glasgow from 1826 to 1829. In 1828 his wife died, and thenceforth his vigor, both bodily and mental, began to decline; and though he afterward published *Letters from the South* (1837), describing a visit which he had paid to Algiers, a *Life of Mrs. Siddons* (1834–42), and a *Life of Petrarch* and either wrote or edited the *Life and Times of Frederick the Great*, he failed to equal his more youthful efforts. In 1831–2 he was editor of the *Metropolitan Magazine*, and in 1832 he founded the Polish Association. Among his works not mentioned above are: *The Advent*, a hymn; *Love and Madness; Lord Ullin's Daughter; The Wounded Hussar; Gilderoy; The Soldier's Dream; Judith; The Name Unknown; The Turkish Lady; Lochiel's Warning; The Rainbow; The Last Man; Navarino; Pilgrim of Glencoe; Moonlight;* etc. See Beattie, *Life and Letters of Thomas Campbell;* and Redding, *Literary Reminiscences of Campbell.*

CAMPBELL, Thomas W., American clergyman: b. Three Rivers, Quebec, Canada, 1851, Sept. 24. He was graduated at Victoria University in 1879, and became a Methodist missionary. Joining the Reformed Episcopal Church, he was elected a bishop in 1891, and presiding bishop in 1894, and resigned to enter the Presbyterian Church in 1898. Since 1899, October, he has been pastor of the Noble Street Church, Brooklyn, N. Y.

CAMPBELL, William, American soldier: b. Augusta County, Va., 1745; d. Rocky Mills, Va., 1781, Aug. 22. He was of Scottish descent. Commissioned a captain in the first regular troops raised in Virginia in 1775, and later becoming a colonel of militia, he distinguished himself greatly in the battles of King's Mountain and Guilford

Court-House. His military career was short but brilliant, and on all occasions marked by conspicuous bravery. Lafayette gave him the command of a brigade of riflemen and light infantry. Washington, Gates, and Greene, the Virginia legislature, and the Continental Congress expressed their high sense of his merits and services. He was taken fatally ill a few weeks before the siege of Yorktown. He married a sister of Patrick Henry.

CAMPBELL, William (Lord), English royal governor of South Carolina: b. (?); d. 1778, Sep. 5. He was the youngest son of John, fourth Duke of Argyle. He received a captaincy in the British navy, 20 Aug. 1762; was a member of Parliament in 1764, and governor of Nova Scotia, 1766–73. In 1774 he was appointed governor of South Carolina, entered upon his duties in June 1775, was courteously received by the people, for whom he professed great friendship. The hollowness of his promises was soon proved, however, and finding his residence in Charleston unsafe, he fled, on board a British man-of-war, where he was soon joined by his wife, who was a Miss Sarah Izard, sister of the patriot, Ralph Izard, who belonged to the wealthiest family in the province. In 1776 Campbell served as a volunteer on board Sir Peter Parker's flagship, Bristol, in the attack on Fort Sullivan, 28 June, and was severely wounded early in the action, while in command of the lower deck. He ultimately died from the effects of the wounds received at this time. Though not of a very firm character, he was possessed of a vigorous courage which frequently displayed itself.

CAMPBELL, William W., American lawyer and historian: b. Cherry Valley, N. Y., 1806; d. there, 1881, Sep. 7. He settled in New York and was a judge of the State supreme court. He wrote *Annals of Tryon County* (reissued as *Border Warfare*); *Life and Writings of De Witt Clinton; Sketches of Robin Hood and Capt. Kidd;* etc.

CAMPBELL, William Wallace, American astronomer: b. Hancock County, Ohio, 1862, April 11. He was graduated from the University of Michigan in 1886, was professor of mathematics at the University of Colorado, 1886–8; and instructor in astronomy in the University of Michigan 1888–91. Since 1891 he has been astronomer at the Lick Observatory, California, and director there from 1901, Jan. 1. He is a member of several American and foreign learned societies, and besides many professional papers has published *The Elements of Practical Astronomy.* (1899).

CAMPBELL, William Wilfred: Canadian author: b. Berlin, Ont. 1861, June 1. He was educated at the University of Toronto and ordained in the Church of England, 1885; retired from the ministry after brief service at St. Stephen, N.B. 1891 and entered the Civil Service at Ottawa; became a contributor of poetry to many magazines, an active member of the Royal Society of Canada,

and an earnest advocate of empire unity. He is cited among the notable poets of Canada. His principal works are *Lake Lyrics and other Poems* (1889); *The Dread Voyage* (1893); *Mordred and Hildebrand; a Book of Tragedies* (1895); *Beyond the Hills of Dreams* (1899); *The Collected Poems of Wilfred Campbell* (1905). He has also written numerous separate poems and Imperial verse, among them *England* (1897).

CAMPBELL-BAN'NERMAN, Sir HENRY, English statesman: b. 1836, Sept. 7. He was the son of Sir James Campbell, but added the surname Bannerman, under the will of a maternal uncle. He was educated at Glasgow University and Trinity College, Cambridge. In 1868 he was elected member of Parliament for Stirling Borough. From 1871–4, and from 1880–2, he was financial secretary to the war office; 1882–4, secretary to admiralty; 1884–5, chief secretary for Ireland, 1886 and 1892–5, secretary of state for war. In 1899, February, he became leader of the Liberal party, and in 1905, Dec. 4, succeeded Sir Arthur Balfour as Premier.

CAMPBELL ISLAND: lonely spot on the s. Pacific lat. 52° 33′ s., long. 169° 9′ e. Though it is mountainous, and measures only 36 m. around, it is valuable on account of its harbors. It is also scientifically interesting, being volcanic, and displaying a rich and rare flora.

CAMPBELLITES: see DISCIPLES OF CHRIST.

CAMPBELL'S STATION, Tenn., the scene of an engagement between Federal and Confederate forces, 1863, Nov. 4. Gen. Braxton Bragg, who was besieging Chattanooga, detached Longstreet's corps of 10,000 men and 35 guns, with Wheeler's cavalry force of 5,000 men, to capture Burnside or drive him out of East Tennessee. Longstreet reached the south bank of the Tennessee, near Loudon, on the 13th. Burnside, who was holding the north bank of the river from Kingston to Lenoirs, concluded to leave one brigade at Kingston and retire the rest of his command to Knoxville, about 30 miles, where he had prepared to make a stand behind defensive works. He skirmished sharply with Longstreet's advance on the 14th, and gradually falling back on the 15th, at night concentrated Hartranft's and Ferrero's divisions of the 9th Corps, and White's of the 23d, at Lenoirs. He had about 5,000 men. Longstreet followed, attacked during the night, and was repulsed. Before daybreak of the 16th Hartranft, with his division and some cavalry, was put on the march to secure Campbell's Station, the intersection of roads coming from the south. Burnside followed closely pursued by Longstreet, with Hood's division, commanded by Gen. Micah Jenkins, with whose advance his rearguard had several sharp encounters. McLaws' division of Longstreet's corps took a more direct road to the left. Hartranft reached the coveted point in advance of McLaws, but, had scarcely made his dispositions when

McLaws appeared and attacked, but Hartranft held on until Burnside, with the trains and the remainder of the troops, had passed and the troops taken position, when he fell back and formed on the left of White's division. It was four o'clock when Hood's division made an attack on Burnside's left, which was repulsed. McLaws attacked his right and was thrown back, and Longstreet then prepared for a general advance of his entire line; but before his preparations were completed it was coming dark, and his train secure and well on the way to Knoxville. Burnside, after dark, resumed his march. His advance reached Knoxville about daybreak next morning, 17 November, Longstreet warily following during the day, and the siege of Knoxville began. In this action at Campbell's Station and the skirmishes preceding it at Huff's Ferry, Lenoirs, and on the march, the Union loss was 303 killed and wounded, and 135 missing. The Confederate loss is not definitely known.

CAMPEACHI, *kăm-pe'che* (Sp. CAMPECHE, *kâm-pā'-chā*): province of Mexico, in the peninsula of Yucatan. It has a few small streams and lakes, a soil mainly sandy, some good pasture lands, and extensive forests. Rice, sugar, and salt are produced, and the fibres of the pita plant or *jenequea* (*agave Americana*) are prepared in large quantities. C. contains the ruins of Tekel and other cities. Area, 18,807 sq. m.; pop. (1900) 84,281.

CAMPEACHY (Sp. CAMPECHE): seaport on the w. side of the peninsula of Yucatan, which divides the Caribbean Sea from the Gulf of Mexico; lat. 19° 50′ n., long. 90° 33′ w. Though it has a shallow haven, yet it is the centre of the trade in logwood; it exports also cotton and wax. It is a handsome city, containing churches, convenes, a cemetery, a theatre, a college, and ship-building docks. Pop. 16,631.

CAMP-EQ'UIPAGE the various movable articles required by soldiers in camp, such as tents, cooking utensils, spades, wagons, and the like; but applicable to the domestic rather than the warlike wants of the soldier. In the days when armor was worn the camp-equipage was enormously heavy and complicated. In the present day, a certain amount of equipage is provided for a given number of troops: see ENCAMPMENT, TENT; etc.

CAMPER, *kâm'pėr*, PETER: 1722, May 11—1789, Apr. 7; b. Leyden: physician and anatomist. He studied medicine at Leyden; in 1750 he became prof. of medicine at Franeker; 1755, at Amsterdam; and 1765, at Groningen. In 1773, he resigned his post, resided some time at Franeker, and then travelled. On being elected a member of the state council, 1787, he removed to the Hague, where he died. Camper was distinguished not only for the services he rendered, to anatomy, surgery, obstetrics, and medical jurisprudence, but also as a promoter of the fine arts. He was remarkably skilful in pen-and-ink drawing, painted

in oil, embossed, and even acquired considerable experience as a sculptor. For his observations on the facial angle, see ANGLE. His work on the connection of anatomy with the art of drawing was an important contribution to the theory of art. Another work, *Description Anatomique d'un Eléphant Mâle,* edited by his son, G. A. Camper, Paris 1802, is worthy of notice. C.'s collected writings, with plates, appeared under the title, *Œuvres qui ont pour Objet l'Histoire Naturelle, la Physiologie et l'Anatomie comparée,* 3 vols. (Par. 1803).

CAMPERDOWN': broad tract of low downs which separates the small hamlet of Camp, in n. Holland, from the German Ocean; about 30 m. n. from Haarlem. It is notable for the victory obtained, off that part of the coast, by Admiral Duncan over the Dutch fleet, 1797, Oct. 11. The Dutch fleet under Admiral van Winter had stolen out of the Texel, with the view of joining the French fleet at Brest, when it was intercepted by Admiral Duncan, and after an obstinate battle, attended with great loss on both sides, the Dutch admiral was compelled to yield, leaving 8 sail of the line and several smaller vessels in the hands of the English, himself becoming a prisoner.

CAMPESTRAL, a. *kăm-pĕs'trăl* [L. *campes'tris,* pertaining to a level field]: relating to fields or growing in them.

CAMP-FOLLOWERS: sutlers and dealers in smallwares who follow an army. In India, owing to the peculiar habits and customs of the Hindus, and the large number of servants retained by English officers, the C. F. are in immense number: comprising servants, sutlers, cantiniers, hostlers, water-carriers, snake-charmers, dancers, conjurors, and women. In Feb. 1839, when a Bengal army of 15,000 men left Shikarpoor for Afghanistan, it was accompanied by no fewer than 85,000 C. F.: the commander took with him six weeks' food for the whole 100,000. All English commanders in India find this regulation very burdensome. Even in European armies, however, C. F. are regarded as necessary; they are under the control of the commanding officer, and are subject to the articles of war—not, however, in cantonments, only in the field. French armies are accompanied by women much more largely than English.

CAMPHENE, *kăm'fēn,* or CAM'PHILENE: artificial variety of camphor obtained from turpentine, by acting thereon with the dry vapor of hydrochloric acid, and keeping the whole at a low temperature by immersing the vessel in a freezing mixture. A solid substance is produced, which separates in white crystalline prisms, and has the taste and aromatic smell of common natural camphor. As prepared, it is strictly a hydrochlorate of C.; but the latter can be obtained free from hydrochloric acid, by passing the vapor of the compound substance over dry heated quicklime, when the acid is held by the lime, and pure C. passes over. It is not so similar to ordinary camphor when thus freed from the hydrochloric acid.

CAMPHENE, n. *kăm'fēn*, or CAMPHINE, n. *kăm'fĭn* [a probable contr. of CAMPHOGEN]: rectified oil of turpentine, obtained from the *Pinus australis* of the southern states; formerly much used for burning in lamps, of late it has largely given place to kerosene. It is very volatile, and burns very freely, giving off a pure white brilliant light; and when the vapor diffuses itself through air, it forms a dangerously explosive mixture.

CAMPHOGEN, n. *kăm'fō-jēn* or *-jĕn* [new L. *camphŏră*, camphor, and Gr. *gennăō*, I bring forth]: the product of the distillation of camphor with dry phosphoric acid.

CAMPHOR, n. *kăm'fĕr* [F. *camphre*—from Ar. *kafur;* Mal. *kaphur;* Sp. *canfor;* mid. L. *camphŏră*, camphor]: a whitish substance of an aromatic bitter taste and fragrant smell, much used in medicine. CAM'PHORATE, v. *-āt*, to saturate or tincture with camphor: ADJ. pertaining to camphor. CAM'PHORA'TING, imp. CAM'PHORA'TED, pp.: ADJ. impregnated with camphor. CAMPHOR-TREE, n. the tree producing camphor. CAM'PHORA'CEOUS, a. *-ā'shŭs*, of or like camphor. CAMPHOR'IC, a. *-fŏr'ĭk*, of or from camphor. CAMPHIRE, n. *kăm'fĭr*, OE. for CAMPHOR.

CAM'PHOR: a solid essential oil found in many plants, and separable from many essential oils. It abounds in certain species of the nat. ord. *Lauraceæ* (q.v.). Almost all the C. of commerce is the produce of the C. Laure or C. tree (*Camphora officinarum*, formerly known as *Laurus Camphora*), native of China, Japan, Formosa, and Cochin-China, and which has been introduced into Java and the West Indies. The genus *Camphora* differs from *Cinnamomum* (see CINNAMON) chiefly in having a thin instead of a leathery calyx. The C. Laurel is a tree of considerable height, much branched, with lanceolate, evergreen leaves on short stalks, and small yellowish-white flowers in axillary and terminal panicles. The fruit is in size and appearance like an imperfectly ripened black currant. Every part of the tree, but especially the flower, smells strongly of camphor. The wood is light and durable, not liable to be injured by insects, and much valued for carpenter's work. In the extraction of C. from the *C. Laurel*, the wood of the stem and branches is chopped up into fragments, and introduced into a still with water, and heat applied, when the steam generated carries off the C. in vapor. These vapors rise, and in passing through rice-straw, with which the head of the still is filled, the C. solidifies, and is deposited round the straw in minute grains or particles, somewhat about the size of raw sugar or coarse sand. These grains of impure C. are detached, and being introduced into a large globular glass vessel in quantities of about 10 lbs., are reheated, when first the water rises in steam, and is allowed to escape at a small aperture; and thereafter, this aperture being closed, the C. sublimes and resolidifies in the interior upper part of the flask, as a semi-transparent cake, leaving all the impurities behind. The flasks are then cooled and broken by throwing cold water on them, and the C. taken out, and sent into

market. The glass globes employed are called by an Italian name, *bomboloes*, the sublimation of C. having been practiced first in Venice.—C. was unknown to the Greeks and Romans, and was first brought to Europe by the Arabs. It is a white, translucent, crystalline substance; it has the chemical formula $C_{10}H_{16}O$, melts at 350° F., boils at 500° F., and sublimes to an appreciable extent at practically all temperatures. It has a strong, pleasant, characteristic odor, and a peculiar, cooling, aromatic taste. Its specific gravity is about 0.992, and it dissolves to a slight extent in water, and freely in alcohol or ether. Small shavings of it exhibit lively motions when thrown upon a water surface that is absolutely free from oily matter.

C. is used in medicine, both internally and externally, as a temporary stimulant. It is frequently employed in gout and rheumatism. In small doses, it acts as an anodyne and antispasmodic; in large doses, it is an irritant poison. It is generally reckoned an anaphrodisiac. Its alcoholic solution and liniments in which it is the principal ingredient, are much used for external application in sprains and bruises, chilblains, chronic rheumatism, and paralysis. It is familiar about the household, on account of its use for protecting furs and woolens from the attacks of moths and other insects. It is also employed in the manufacture of celluloid and various explosives. The chemistry of camphor is very complicated, and numerous substances are known that resemble it closely, and yet differ from it in certain particulars. See BORNEOL.

The BORNEO C. or SUMATRA C. of commerce, sometimes called HARD C., is the produce of *Dryobalanops aromatica*, a large tree of the nat. ord. *Dipteraceæ* (q.v.). The C. is obtained by cutting down the tree, and splitting it into small pieces; being found in crystalline masses in natural cavities of the wood. To this substance the Chinese ascribe extraordinary medicinal virtues, so that it is sold among them at more than fifty times the price of common camphor. It is seldom exported as an article of commerce.—The *Dryobalanops aromatica* yields also a pale, yellowish limpid fluid, which gushes out when deep incisions are made in the tree with an ax, and which is generally called LIQUID C. or C. OIL. It is sometimes imported into Europe. It has a smell somewhat resembling that of C., but more aromatic, like oil of cajuput. It is supposed to be from this fluid that the crystalline Hard C. is deposited. See BORNEENE.

CAMPHOR'IC ACID, a substance crystallizing in colorless, needle-like, monoclinic crystals, and obtained by boiling camphor with concentrated nitric acid. It has the formula $C_{10}H_{16}O_4$, and a specific gravity of 1.19, and melts it about 370° F. It is almost insoluble in cold water, but is soluble in hot water, alcohol and ether.

CAMPHUYSEN, *kâmp'hoy-zĕn*, DIRK RAFAELSZ: 1586—1627, July 9: Dutch painter and poet; b. Gorcum. He

studied under Goritz, and won early fame by small landscapes and figure-pieces, executed with delicacy and beauty uncommon in his school, but soon exchanged art for divinity. Espousing the tenets of Arminius, he was driven from his parish of Vleuten, suffered much persecution, and for a time wandered as a fugitive. Camphuysen wrote a *Compendium Doctrinæ Sociniorum* and other theological works, translated the Psalms into Dutch verse, and produced sundry lyrics which have won much praise and been often reprinted. He died at Dokkum.

CAMPI, *kâm′pē:* family of artists who founded at Cremona, in the middle and near the close of the 16th c., an eclectic school of painting, parallel with that founded by the family Caracci (q.v.).

Giulio C., 1500–72, was the head of the school. He studied painting, sculpture, and architecture under Giulio Romano. He also imitated the works of Titian (at least in coloring) and Pordenone with such success that his pictures have sometimes been ascribed to both of these artists. His female heads, like those of his brothers, are remarkably beautiful.

Antonio C. studied under his brother, both painting and architecture. His knowledge of the latter was very serviceable in several of his paintings; for example, that of the sacristy of St. Peter. He was also a plastic artist, an engraver, and the historian of his native place.

Vincenzo C., before 1532–91, seems to have followed the guidance of Antonio rather than that of Giulio, and excelled in small figures. His paintings of fruits are highly valued.

Bernardino C., 1522—abt. 1590, kinsman of the three brothers C., was the most famous of the whole. Lanzi terms him 'the Annibale Caracci' of the school. He studied first under Giulio C., but soon excelled his master. Afterward, he chose Giulio Romano, Titian, and Correggio as models, but chiefly followed Raphael, yet without servile imitation. Many of his works are found in Milan and Cremona. In the latter place, the cupola of the choir in the church San-Gismondo is Bernardino's masterpiece. He was distinguished as a portrait-painter, and engraver. The lady-painter, Sophonisba Anguissola, was a distinguished pupil of Bernardino Campi.

CAMPIAN, or CAMPION, *kăm′pĭ-ŭn,* Edmund: 1540–81, Dec. 1; b. London. He studied at Oxford, became a fellow of St. John's College, delivered an oration before Queen Elizabeth 1566, and was ordained deacon 1567. Going to Ireland, he wrote its *History* (published 1633), and became a Rom. Cath. He entered the English college at Douai, and was admitted a Jesuit at Rome 1573. After writing a tragedy at Vienna and teaching rhetoric and philosophy at Prague, he was sent to England 1580 by Gregory XIII., and boldly challenged the clergy and universities to a debate. Making too many converts, he was charged with treason, put to the torture, executed at Ty-

burn and the parts of his body exposed in several towns, while the Duke of Anjou was in England wooing the queen. Wood [*Athen. Oxon.*] says all writers accounted C. 'a man of most admirable parts, an elegant orator, a subtle philosopher and disputant, and an exact preacher, whether in English or Latin.' He wrote several books in Latin. His Life was written by Paul Bombino.

CAMPIMETER, *kăm-pĭm′ē-ter* [*L. campus*, field; *metrum* measure]: an instrument used in psychology and physiology for the measurement of the distribution of sensitivity in the field of vision. It is distinguished from the perimeter (q.v.), also employed for the same purpose, only in that surface upon which the colors are moved is plane instead of spherical.

CAMPION, n. *kăm′pĭ-ŏn* [It. *campiōne*, campion]: the corn-campion; a name for various species of common wild plants, as *catch-fly*, *cuckoo-flower*, and *bachelor's button*, belonging to the genus *Lychnis*, ord. *Caryōphyllacĕæ:* see LYCHNIS: SILENE.

CAMPINAS, *kâm-pē′nâs*, or SAN CARLOS: town of Brâzil, in the province, and 70 m. n. of the city, of Sao Paulo; in a fertile and picturesque district on a small river, the Piraticaba, a feeder of the Parana. There are large coffee and sugar plantations in the surrounding district, and large quantities of sugar are exported. Many of the houses are built of mud or clay, and the immense church, whose walls are five ft. thick, is composed of beaten earth. Pop 12,000.

CAMPOAMOR Y CAMPOOSORIO, RAMON DE, *râ-mōn dā-kâm-pō-a-mōr′ē kâm-pō-ō-sō′rē-ō*, Spanish poet: b. Navia 1817, Sep. 24; d. 1901, Feb. 11. He studied medicine at Madrid for a time, but gave it up for literary work. He also entered political life, was governor of Alicante and Valencia and became state counselor under King Alfonso XII. in 1874. In politics he was a Conservative and his views are expressed in *Polémicas con la Democracia.* His chief work was in poetry, and he is considered one of the greatest Spanish poets of the 19th century; his attitude of thought is distinctively modern, and the interest of his best writings centres in modern life and problems. His best-known and most characteristic poems are the *Doloras* (1856); a collection of short pieces which he himself defines as 'dramas taken direct from life:' *Los Pequeños Poemas* (1887), dealing with the 'little things' of life; and the *Humoradas* (1890), a collection of epigrams. He wrote also two long narrative poems, *Colon* (1853) in 16 cantos, and *El Drama Universal*, and shorter narrative poems which are much more successful among which are: *Los Buenos y los Sabios; El Amor y el Rio Piedra; El Trén Express; La Nina y el Nido; Los Grandes Problemas.* His latest poems are *Licenciado Torralba* (1892); and *Nuevos Poemas* (1892). He also wrote dramas, which did not prove successful on the stage. These include *Dies Iræ* (1873); *El Honor* (1874); and *Cuerdos y Locos* (1887);

Among his prose writings are *La Filsofía de las Leyes* (1846) *El Personalisimo* (1850); *Lo absoluto* (1862); giving most fully his philosophical system; *El Idealismo* (1883); and *La Poetica* (1883), summarizing his theory of poetry.

CAMPOBASSO, *kâm-pō-bâs'sō:* fortified town of s. Italy, in the province of the same name, about 53 m. n.n.e. of the city of Naples. The town stands on the slope of the Monte Verde, in a cool, airy, and healthful region. It has a fine cathedral, a ruined castle, some convents, and palaces belonging to resident nobles. It has manufactures of cutlery, which has considerable reputation for excellence. Its situation, though far from inviting as regards scenery, is favorable for trade, which is facilitated by good roads. Pop. (1901) 15,030.

CAMPOBELLO, *kâm-pō-bĕl'lō:* island of New Brunswick, situated at the mouth of the Passamaquoddy Bay 2 m. from Eastport, Me.; lat. 44° 57′ n., long. 66° 55′ w. It is 9 m. long, and 1–3 m. broad; but it is valuable, possessing some good harbors, and, at its n. end, a light-house 60 ft. in height. Ores of copper and lead have been found. The people are mostly fishers. In recent years it has gained some note as a summer resort.

CAMPO-FORMIO, *kâm'po fawr'mē-o:* village in the province of Udine, n. Italy, about 7 m. s.w. of the city of Udine; noted for the treaty of peace here concluded. 1797, Oct. 17, between Austria and the French Republic. After subjugating Italy (1796), the French army had crossed the Noric Alps, and threatened Vienna. Austria, therefore, hastened to arrange preliminaries of peace. In the treaty which was concluded by Bonaparte with the Count of Coblenz, 1797, Oct. 17, Austria ceded the Netherlands, Milan, and Mantua, and received as compensation the districts Istria, Dalmatia, and the left bank of the Adige in the Venetian states, and the capital, Venice; while France took the remaining territory of Venice, its possessions in Albania, and the Ionian Islands. In the secret articles of the treaty, Austria, in ceding the left bank of the Rhine, was to receive as compensation Salzburg and the Bavarian district on the Inn; and promises were held out to the Duke of Modena, and other Italian houses, that their concessions should be compensated at the cost of Germany.

CAMPOMANES, *kâm-po-mâ'nēs,* Pedro Rodriguez, Count of: 1723–1802, Feb. 3; b. Asturias, Spain: Spanish minister and director of the Royal Acad. of History at Madrid, founded by Philip V., 1738. His talents and learning were devoted to the advancement of his native country. By his enlightened views of state policy, as well as by his writings, he obtained great reputation throughout Europe. He gave effectual assistance to Count Aranda in his difficult enterprise of driving the Jesuits out of Spain. Campomanes' chief works are—*Antiguedad Maritima de la Republica de Cartago con el Périplo de su general Han non, traducido del Griego y illustrado* (Madrid, 1756); *Discurso sobre el fomento de la Industria popular*

(1771); *Discurso sobre la Educacion popular de los Artisanos y su fomento* (1775); *Apéndice al a Educacion popular* (1775–1777). The best known of his financial productions is *Tratado de la Regalia de Amortizacion* (Madrid, 1765).

CAMPOS, Arsenio Martinez, *âr-sā'nē-o mâr-tē'nĕth kâm' pōs*, Spanish military officer: b. Segovia, Spain, 1834, Dec. 14; d. 1900, Sep. 3. He was graduated at the Military Staff School in Madrid and appointed a lieutenant in the army in 1858; served on the staff of General O'Donnell and became chief of the battalion in the Morocco campaign of 1859; was on duty in Cuba with the rank of colonel in 1864–70; took part in suppressing the Carlist insurrection and was promoted brigadier-general in 1870; opposed the republic after the abdication of King Amadeus, and was imprisoned as a conspirator. Under a plea for permission to be allowed to serve as a private, he was released and given command of a division in the 3d Army Corps in 1874. In the next two years he was constantly fighting the Carlists, distinguishing himself at Las Munecas and Galdames and causing the noted siege of Bilboa to be raised. With Gen. Jovellar, he called Alphonso XII. to the throne; was made commander-in-chief of the Catalonia district, and crushed Don Carlos at Pena de la Plata in 1876. For these services he was promoted captain-general. In 1877 he was appointed commander-in-chief in Cuba, and brought the revolution to a close chiefly by means of concessions which, as minister of war and premier in 1879, he endeavored unavailingly to carry out. He was minister of war in 1881 and 1883, commander of the Army of the North of Spain in 1884–5, president of the Spanish senate in 1885; and captain-general of New Castile in 1888. In 1895, April, he was appointed governor-general and commander-in-chief in Cuba, and in 1896, January he was recalled to Spain. He found the insurrection more formidable than he had anticipated, and his failure to pursue a vigorous war policy caused much dissatisfaction in Spain. On his arrival in Madrid he repeated his belief that the trouble in Cuba could only be ended by granting reforms.

CAMPO SANTO, *kâm'po sân'to* [Holy Field]: Italian designation for a cemetery or burying-ground, but especially for an inclosed place of interment, surrounded internally by an arcade, and intended for the remains of persons of distincton. The most famous Campo Santo, and that from which the others derived the name, is that of Pisa— in the neighborhood of the dome, and consecrated to the memory of men who had deserved well of the republic. It was founded by Abp. Ubaldo, toward the end of the 12th c. The archbishop, having been driven out of Palestine by Saladin, brought his 53 vessels, which had been destined for the conquest, laden with the earth of the Holy Land. This he deposited on the spot which was thence called the Holy Field, and which gave its name as a generic term to the burying-grounds of Italy. The architect of the existing building was Giovanni Pisano, under whose superintendence it was completed, 1283. It contains an

area of 400 ft. in length, and 118 in breadth; and is surrounded by a lofty wall, on the inner side of which a wide arcade runs round the whole inclosure, giving to it the character of one magnificent cloister. At the smaller e. side there is a large chapel, and two chapels of smaller size on the n. side. As a museum of classical antiquities, the Campo Santo is perhaps more remarkable than in any other point of view. Altars, sarcophagi, bas-reliefs, statues, inscriptions, all that is interesting or curious which has come into the possession of the Pisans for centuries, they have accumulated within its walls.

CAMPTOTROPAL, a. *kămp-tŏt'rŏ-păl* [Gr. *kamptos*, flexible, bent; *tropos*, a turn]: in *bot.*, having curved ovules when the portions on either side of the line of curvation are equal; curved like a horse-shoe.

CAMPUS, *kămp'ŭs:* from a Sicilian word signifying race-course; in antiquity, an open space or park given up to exhibitions, combats, exercises, etc.: Rome had eight, the chief being the *Campus Martius*. This was outside the walls, between the Tiber and the Capitoline and Pincian hills. Here stood the temple of Mars, and here, from mythical days, the *Comitia Centuriata* met. In the legends Tarquinius Superbus sowed it with grain, but Brutus and Collatinus restored it to popular use. Here the youth were exercised, and the bodies of the great cremated; here the *villa publica* was erected for magistrates and ambassadors. By degrees it became a pleasure ground. Cæsar put up halls for the *Comitia;* Agrippa, the Pantheon and the first public baths; Augustus, his mausoleum and the Egyptian obelisk; and Taurus, the first stone amphitheatre. Under the empire it was filled with public and private buildings, the ruins of which make it one of the most interesting parts of Rome. Aurelian inclosed it within the walls. The College Campus, in modern times, is the space about the college buildings. For uses of sport and contest it has been mainly displaced of late years by the athletic grounds and the gymnasium.

CAMPVERE, *kâmp'vär*, now called VERE, VEERE, or TER-VERE: small fortified town on the n.e. of the island of Walcheren, in the Netherlands province of Zealand, four m. n.n.e of Middelburg It has a port on the Veersche Gat, which runs from the Sloe to the Roompot, separating Walcheren from North Beveland. From a historical point of view, Campvere is a town of great interest. In 1304 it was the scene of a battle between William, Governor of Holland and Zealand, and Guy, Count of Flanders, who was victorious. In 1572 the Spaniards were driven away; and a century later Campvere was the first town which proclaimed William III., the Prince of Orange, general stadtholder. It is interesting chiefly as the seat of a Scottish factory or commercial station for three and a half centuries. Wolfaard van Borssele, Lord of Campvere, having, in 1444, married a princess of the

Stuart line, an impulse was given to the Scottish trade. A factory of merchants was formed, and by contract between the royal burghs of Scotland and the United Provinces, C. became the only staple port. The goods could not be transferred to any other place until sold, merchants resorting thither to do business. The factors obtained many privileges, such as freedom from several duties and the right of being governed by the law of Scotland, having a lord conservator who was supreme judge in all matters. No factor might settle at C. without the written authority of the commissioners of royal burghs of Scotland, who took security for his honorable behavior. In 1795 the Batavian republic withdrew the privileges, and the factory was broken up, but the conservatorship was held as a sinecure long after the necessity for the office had ceased, the name of Sir Alexander Ferrier appearing in the *Edinburgh Almanac* as 'conservator at Campvere' so lately as 1847. The magistrates of C. were bound to provide a church for the factory, 'to the end that the people of the Scottish nation be not frustrate of the Word of God and exercise of the reformed religion in their own proper language.' The ministers were appointed by the commissioners of royal burghs, 1613–1790, when the last appointment was made.

CAMPYLOSPERMÆ, n. plu. *kăm'pĭ-lō-spĕr'mē* [Gr. *kam'pulos*, bent, curved; *sperma*, seed]: seeds with the albumen curved at the margins so as to form a longitudinal furrow. CAM'PYLOSPER'MOUS, a. *-spĕr'mŭs*, having the albumen of the seed curved at the margin, thus forming a longitudinal furrow.

CAMPYLOTROPAL, a. *kăm'pĭ-lŏt'rŏ-păl*, or CAM'PYLOT'ROPOUS, a. *-rŏ-pŭs* [Gr. *kam'pŭlos*, bent, curved; *trŏpaō*, I turn]: in *bot.*, having the ovule and its integuments so bent that the apex is brought near the hilum, the hilum and chalaza being together.

CAMTOOS, *kâm-tōs'* or *kăm-tôs'*, or GAMTOOS, *gâm-tôs'*: river of the e. division of the Cape Colony, 200 m. in length. It rises in the Niewveld Mountains, near lat. 32° s., and, flowing through the inland dist. of Beaufort, and the maritime dist. of Uitenhage, falls into that inlet of the sea which is immediately w. of Algoa Bay. It is valuable as an aid to irrigation. For instance, Hankey, a station of the London Missionary Soc. on its banks, is thoroughly watered by means of a tunnel carried through solid rock at the expense of the association just mentioned.

CAMUCCINI, *kâ-môt-chē'nē*, VINCENZO: 1775–1844, Sep. 2; b. Rome: historical painter. The school of which he became the head was founded on the theatrical antique style of the French painter David. The first important works by C. were the *Assassination of Cæsar* and the *Death of Virginia;* both painted for Lord Bristol at the commencement of the present century. His picture of *Unbelieving Thomas* was copied in mosiac for St. Peter's Church. For the church of San Giovanni in Piacenza he executed a *Presentation in the Temple*, which was greatly

admired. These works were followed by many scenes from Roman history; among them, the pictures of *Horatius Cocles*, and *Romulus and Remus* as children. C. was highly honored for his character as well as his art. He died at Rome.

CAMUS, a. or n. *kā'mŭs* [F. *camus*]: in *OE.* flat-nosed; a pug-dog.

CAMUS, n. *kā'mŭs* [It. *camicia*, a shirt—from mid. L. *cămisa* (see under CAMISADE)]: in *OE.*, a thin loose dress of silk or other material.

CAMUS, *kâ-mûs'*, ANTOINE LE: 1722–1772; b. Paris: celebrated physician. He became prof. in the Univ. of Paris, 1762, was noted for the original character of his technical publications and his literary ability, and was the author of a comedy, *Love and Friendship*, a poem *The Medical Amphitheatre* (1745), *Maladies of the Region of the Heart*, and *The Medicine of the Mind* (1753).

CAMUS, *kâ-müs'*, ARMAND GASTON: 1740, Apr. 2—1804, Nov. 2; b. Paris: prominent in the French Revolution. On account of his superior knowledge of ecclesiastical law, he was elected advocate-general of the French clergy. He was a zealous and ascetic Jansenist, with extraordinary firmness of character. He hailed the movements of 1789 with joy, and was elected member of the states-general by the people of Paris. In this position, he appeared as the resolute foe of the ancient régime. He gained possession of, and published, the so-called *Red Book*, giving accounts of court expenditure, which was highly disadvantageous to the court and its ministers. After the flight of Louis XVI., C., with Montmorin, Lafayette, and Bailly, accused the king of treason and conspiracy, and insisted on the suppression of all orders and corporations based on hereditary rights. As conservator of the national archives, he rendered an important service by preserving from destruction the old documents of the abolished corporations and institutions. He was absent in Belgium during the king's trial, but sent his vote for death. In 1793, March, when he was commissioned to make prisoners of Dumouriez and other generals suspected of treason, C. himself and his four colleagues were taken prisoners and delivered over to the Austrians (Apr. 3); but, after an imprisonment of two and a half years, he was exchanged for the daughter of Louis XVI. On his return to Paris, he was made member of the Council of Five Hundred, of which he became pres. 1796, Jan. 23, but resigned 1797, May 20, and gave his time to literature. Remaining true to his principles, he voted, 1802, July 10, against Napoleon's proposed consulship during life. C. died of apoplexy.

CAMUSAT, *kâ-mü-zâ'*, NICOLAS: 1575–1655; b. Troyes: priest and antiquarian. He held the appointment of canon of the church in his native city, and wrote many works, one of the most famous being *Melanges historiques* (1619).

CAMWOOD, n. *kăm'wûd:* a red dyewood, obtained

principally from the vicinity of Sierra Leone, where it is called *kambi*, whence the name: it is called also *barwood*. It yields a brilliant but not permanent red color, and is used with sulphate of iron to produce the red in English bandana handkerchiefs. It is the wood of *Baphia nitida*, a tree of the nat. ord *Leguminosæ*, sub-order *Cæsalpinieæ*, native of Angola. It is preferred to Brazil wood (q.v.), as producing a finer and richer red.

CAN, n. *kăn* [Icel. *kanna*, a large drinking-vessel]: Ger. *kanne*, a tankard: W. *cannu*, to contain: AS. *canne*]: a cup or other vessel made of metal. CAN'AKIN, n. *-ă-kĭn*, a little can.

CAN, v. *kăn* [AS. *cunnan;* Icel. *kunna*, to ken, to know: M.H.G. *kunnen*, to be able]: *can* denotes power or ability when joined to another verb, as I *can* eat—that is, I have power to eat; in *OE.*, to know or understand. COULD, pt. *kûd*. *Note.—Could* is a mis-spelling for *coud* [OE. and Scot. *coud*], the *l* having been inserted from a supposed analogy with *should* and *would*.

CANA, *kā'na*, OF GALILEE: scene of our Lord's first miracle; about 13 m. w. of the Sea of Galilee. Two modern villages claim to represent the sacred site, and authorities are divided as to the identification One village, now called Kefr Kenna, is about 3 m. n.e. of Nazareth; the other, Kana el Jelil, is about 8 m. n. of Nazareth. Robinson supports the claim of the latter. Stanley considers the claims about equal.

CANAAN, *kā'nan* or *kā'na-an:* fourth son of Ham and grandson of Noah. C.'s 10 sons were progenitors of 10 Syrian tribes, and the whole land of Palestine was named from him. To his eldest son, Zidon, is attributed the founding of the city of Sidon.

CANAAN, LAND OF:—CANAANITES: see PALESTINE. SYRIA.

CANAANITE, a. *kā'nan-īt* or *kā'nā-an-īt:* pertaining to or of the land of Canaan: N. a native of the land of Canaan; the general name for the heathen peoples (Jebusites, Hittites, Amorites, etc.) whom the Israelites found dwelling in Canaan (q.v.), west of the Jordan, and whom latterly they utterly subdued, though the subjugation was not quite complete till Solomon's time. They are believed to have been, in part at least, of kindred race with the Irsaelites; and some authorities find traces of their descendants among the present inhabitants of Palestine. The name Canaanites was also applied in a more restricted sense to one of these peoples.

CANACE, *kăn'ă-sē* (1) In Greek mythology, a daughter of Æolus and Enarete, who was punished by death because of her unlawful passion for her brother; she is mentioned in Gower's *Confessio Amantis*, and in Chaucer's *Man of Law's Tale*. (2) In Chaucer's *Squire's Tale* the daughter of King Cambuscan.

CANADA.

CANADA, DOMINION OF. *Political Divisions.*—The Dominion of Canada embraces most of the northern half of the continent of North America and its adjacent islands—with certain exceptions. Greenland (q.v.) belongs to Denmark, Alaska (q.v.) to the United States, Newfoundland (q.v.) is still a separate British colony with an undefined strip of dependent territory on the Labrador coast of Canada, and the small islands of St. Pierre and Miquelon belong to France. To the extreme north all the islands are practically claimed by Canada acting for Great Britain and in 1906 14 islands were taken possession of by a Canadian exploration expedition under Captain Bernier. The official figures of Canada's area are 3,745,574 square miles, of which 125,755 square miles are water. Its geographical and political divisions are as follows:

PROVINCES AND DISTRICTS.	DATE ORGANIZED OR ADMITTED.	AREA, SQUARE MILES.		
		WATER.	LAND.	TOTAL.
Original Confederation—				
Ontario	July 1, 1867	40,354	220,508	260,862
Quebec	July 1, 1867	10,117	341,756	351,873
Nova Scotia	July 1, 1867	360	21,068	21,428
New Brunswick..	July 1, 1867	74	27,911	27,985
Provinces Admitted				
Manitoba.	July 15, 1870	9,405	64,327	73,732
British Columbia	July 20, 1871	2,439	370,191	372,630
Prince Ewd. I. . .	July 1, 1873	. . . . .	2,184	2,184
Districts Created—				
Keewatin.	Apr. 12, 1876	13,419	456,997	470,416
Assiniboia.	May 17, 1882*	600	88,279	88,879
Saskatchewan. . .	May 17, 1882*	3,772	103,846	107,618
Alberta.	May 17, 1882*	362	101,521	101,883
Athabaska.	May 17, 1882*	8,805	243,160	251,965
Yukon.	June 13, 1898	649	196,327	196,976
Mackenzie.	Oct. 2, 1895	29,548	532,634	562,182
Ungava	Oct. 2, 1895	5,851	349,109	354,961
Franklin.	Oct. 2, 1895	. . . . .	500,000	500,000
Totals.	. . . . .	125,755	3,619,819	3,745,574

*NOTE: On 1905, Sept. 1, the districts of Assiniboia, Saskatchewan, Alberta and Athabasca were, in great part, admitted to Confederation as the Provinces of Alberta and Saskatchewan with an estimated area of 250,000 square miles each. The area of the Dominion is, therefore, somewhat larger than that of the United States (including Alaska) and not much less than that of Europe.

Physical Features.—The chief surface divisions of Canada are: (1) The Appalachian region in the extreme southeastern corner; (2) the Laurentian plateau, comprising the remainder of the eastern half of the country; (3) the great central plain, one of the most fertile and productive prairie regions of the world; and (4) the mountain region of the west.

The Appalachian ranges run from southwest to northeast and nowhere do the hills exceed 4,000 feet, that height being reached only in the extremity of the Gaspé peninsula. One range of these elevations follows almost the entire eastern coast of the provinces of Quebec and Nova Scotia and has a range which covers practically the whole central and west central area.

CANADA.

The Laurentian plateau begins in the south at the St. Lawrence River, extends up through and to the coast of Labrador on the east, on the north is broken into by Hudson's Bay and on the west slopes gradually till it merges into the central plain, the western limit being marked by a series of great lakes, from Great Bear and Great Slave lakes in the north, Athabasca and Reindeer in the north central, and Winnipeg, Winnipegosis and Manitoba in the central to the Great Lakes of the southern border. The greatest height of the Laurentian plateau is attained in its eastern extremity in Labrador. Here occurs a range of hills, bordering on the Atlantic, which reaches a height of 6,000 feet, but elsewhere in Labrador the plateau seldom exceeds 1,800 feet and gradually slopes toward the west. South of the Laurentian plateau is a lowland area consisting of the valley of the St. Lawrence River and the peninsula enclosed by lakes Huron, Erie and Ontario. These lowlands nowhere greatly exceed 1,000 feet in height (or about 500 feet above the level of lakes Huron and Erie) and they sink gradually with the river to its mouth.

The central plain is a continuation of the great plain which stretches from the Gulf of Mexico to the Arctic Ocean. At the border line between the United States and Canada this plain is about 800 miles in width but toward the north it is gradually narrowed on the east by the westerly trend of the Laurentian plateau and on the west by the encroachment of spurs and subsidiary ranges of the Rocky Mountains. Still further north, however, where it terminates at the Arctic Ocean, the plain expands to a width of about 300 miles. This great plain has three steppes of different elevations which rise from the valley of the Red River, about 80 feet above sea-level, to the foot-hills of the Rocky Mountains, where the extreme elevation is 4,200 feet and the average elevation 3,000 feet. Thus the general slope is from the southwest downward to the east and north.

The mountains of the west form a portion of the Cordilleran system which traverses the entire length of the American continent from the lowest extremity of South America to the most westerly point of Alaska. The Canadian portion is about 400 miles in width, the greatest average being in the southern part. The most easterly range is the Rocky Mountains, while to the west a number of smaller ranges—the Selkirk, Columbia, Gold, and Coast—run parallel with it, the most westerly of these being represented by the mountains of Vancouver Island and the Queen Charlotte Islands. The St. Elias range, near the Alaskan frontier and not far from the Pacific, attains the greatest altitudes, the highest peak (Mt. Logan) being over 19,000 feet. In the southern portion of the Rocky Mountains and the parallel ranges immediately to the west, there are several peaks which exceed 13,000 feet, Mt. Columbia reaching nearly 14,000 feet. Approaching the Pacific, the height of the ranges diminishes,

and in Vancouver the highest peak is less than 7,500 feet. For physical features and other information regarding the various Provinces, consult the special articles under their titles in this encyclopædia.

Rivers and Lakes.—In the eastern part of the country the principal bodies of water are the indentation of the continent to the north by Hudson's Bay—an arm of the sea 800 miles from north to south and 600 miles in width; the St. Lawrence River penetrating the provinces of Ontario and Quebec in a southerly and westerly direction for a navigable distance of over 2,300 miles from the ocean; and the expansions of this river including Lake Superior with a water surface area of 31,800 square miles, Lake Huron, 23,200 square miles, Lake Erie, 10,030 square miles, Lake Ontario, 7,260 square miles and smaller lakes such as Nepigon, St. John, Simcoe, St. Clair, and others, making a total of 75,000 square miles. Half of the area of the first four are, politically, in the United States with a portion of the St. Lawrence River where it touches the international border. The tributaries of the St. Lawrence include the Ottawa, with a length of 780 miles, the St. Maurice, the Saguenay, the Richelieu and many others. West and north of the St. Lawrence River and its tributaries are many rivers of large size.

In the Territories and Manitoba are the Mackenzie (2,400 miles in length), the Coppermine and Great Fish Rivers, which flow into the Arctic Ocean; the Saskatchewan River (1,500 miles); the Nelson River discharging from Lake Winnipeg and, with the Churchill, the Haye and other rivers which flow into Hudson's Bay, draining into that body the waters of an area estimated at 370,000 square miles. In British Columbia are the Fraser River and the Columbia (1,200 miles), and in the Yukon District is the Yukon River, which carries off the surplus waters of a great tract of country in Canada before flowing into the sea on the western side of the United States District of Alaska. Connected with these and other rivers are lakes of large size—Lake of the Woods (1,500 square miles), Lake Manitoba (1,900), Great Bear Lake (11,200), Great Slave Lake (10,000), Athabasca (4,400), Winnipeg Lake (9,400), Winnipegosis (2,030).

Climate.—Embracing half a continent, as Canada does, there is naturally a great variety of climatic changes and conditions. On the Pacific coast, with the Pacific ocean on the one side and lofty mountain ranges on the other, it is moist and temperate. Vancouver Island, off the coast, is the seat of the Provincial capital, with seasons very much like those of England. The mainland along the Straits of Georgia has a warm summer and a winter increasing in severity toward and in the higher levels of the mountain ranges. At Agassiz, on the Lower Fraser, 70 miles from Vancouver, the average mean temperature in January is 33° and in July 64° with a daily range of 10° in the former month and 26° in the latter. The lowest temperature on record is 13° and the highest 97°. Frosts

seldom occur in May and there is no record of any during the summer months. In various valleys amongst the mountains the climate is excellent and fruit farming a most profitable occupation.

On the east side of the Rockies, for some distance, the climate is greatly affected by the warm 'Chinook' winds and from thence along the high level plateau of Alberta, Saskatchewan and Manitoba the temperature reaches, at times, the extremes of heat and cold but is, withal, a bright, dry, bracing and healthy atmosphere. Cold winters, warm summers and a small rain and snow fall are the chief characteristics. The mean temperature for July at Winnipeg is 66°, and at Prince Albert 62°. The former temperature is higher than in any part of England, and the latter is very similar to that found in many parts of the southern countries; the diurnal range, however, is different from any found in England, the average daily maximum temperature at Winnipeg being 78°, with a minimum of 53°, and at Prince Albert a maximum of 76°, with a minimum of 48°; and owing to these high dry temperatures, with much sunshine, the crops come to maturity quickly.

To the north and northeast of Lake Superior is found a very cold region with temperatures falling 50° below zero at White River—a station on the line of the C. P. R. Eastwards from this part of Ontario and toward the valleys of the Ottawa and Upper St. Lawrence there is found a moderately cold winter with an exhilarating atmosphere. By the beginning of May foliage is well advanced and is followed quickly by a warm summer. The mean annual temperature of Montreal is 41° 8′ and of St. Petersburg, Russia, 38° 7. The peninsula of Ontario is affected by the neighborhood of the Great Lakes—the winters being mild and the summers moderate in their degree of heat.

As in the Ottawa and St. Lawrence valleys the summer temperature of this peninsula may be compared with that of France; the normal condition for July ranging between 66° and 72°. September and October are exceptionally pleasant months and snow seldom falls before December, except on the higher lands of the interior counties. Toward the north, in the District of Muskoka, at an elevation of 740 feet above the sea there is a region of small lakes with bracing atmosphere and bright sunshine in the summer months. The winters throughout Quebec are cold and between December and March the ground has usually a deep covering of snow. In the Atlantic Provinces, lying between the same parallels of latitude as France, the climate is exceptionally pleasant with spring opening a little later than elsewhere and summer lingering a little longer. Severe heat is seldom experienced. The Great Lakes never freeze over, though most of the harbors are closed by ice from the middle of December to about the beginning of April. The closing and opening of navigation on the St. Lawrence at Montreal run about the

same period. Harbors on the Gulf of St. Lawrence are similarly closed but those on the Bay of Fundy and coast of Nova Scotia are open all the year round.

Geology.—The geological formations of Canada are of the greatest importance, providing, as they do, massive mountains seamed with valuable minerals, rivers washing over golden gravels, water-falls affording power enough to run the manufacturing establishments of a new world, prairie and lowland soils of the richest agricultural possibilities. The Laurentian plateau, with relatively high and generally rocky land, runs from the Labrador peninsula around the southern extremity of Hudson's Bay and continues north-westward to the Arctic Ocean. Composed of Archæan rocks—the oldest known rock formation—and surrounding the central depression of Hudson's Bay, its southern outline has determined the position of the Great Lakes and the St. Lawrence River. South of it juts out the Ontario peninsula, north-west of it is the Winnipeg system of lakes, while between the western edge of the Laurentian highlands and the Cordilleran ranges runs a wide tract of central plain northward to the Arctic Ocean. The late Dr. George M. Dawson, one of the ablest of Canadian geologists, made a general division of the Dominion in this respect as follows: (1) The Acadian region including the Maritime Provinces of the Atlantic, with the similarly characterized southeastern part of the Province of Quebec, bounded by a line running from the Strait of Belle Isle to the City of Quebec, and thence to Lake Champlain; (2) The lowlands of the St. Lawrence valley, extending with an irregular width from the City of Quebec to Lake Huron, and including the Ontario peninsula; (3) The Laurentian plateau, which, notwithstanding its vast area, may, from a physiographical point of view, be regarded as a unity; (4) The interior continental plain, running with narrowing dimensions from the 49th parallel to the Arctic Ocean, and embracing part of Manitoba and Saskatchewan and Alberta; and (5) The Cordillera, or great mountain belt of the west including the greater part of British Columbia and the whole of the Yukon district.

The Acadian region forms the north-eastward continuation of the Appalachian mountain system which begins not far from the Gulf of Mexico and gives form to the eastern coast of the United States. In length it is about 500 miles and in character belongs to the Palæozoic formation. The Shickshock and Notre Dame mountains in Quebec and the Atlantic Coast range of Nova Scotia are included in the system. The latter area is of old Cambrian rocks rich in gold-bearing veins while the Cobequid Hills of Nova Scotia, extending into Cape Breton, contain important coal fields. Two exceptions to this geological condition are to be found in the Island of Anticosti in the Gulf of St. Lawrence and in Prince Edward Island lying opposite the lowlands of eastern New Brunswick and northern Nova Scotia. The region as a whole is con-

sidered one of exceptional geological disturbance and complexity due, in part, to the existence of thick masses of strata composed of ancient volcanic materials without organic remains—a character common to the rock formations of the Appalachian region of North America.

The lowlands of the St. Lawrence valley embrace a small part of the hydrographic basin of the great river which is, in all, about 530,000 square miles in extent. It stretches from below the City of Quebec to Lake Huron and includes an area of 35,000 square miles of fertile, arable land. The strata of this region is nearly horizontal and ranges from the latest Cambrian to the Devonian. The rocks flooring it lie upon the spreading base of the Archæan mass to the northward and the Crystalline rocks of the latter are met with in deep borings. Mount Royal and similar elevations in the neighborhood of Montreal represent the wrecks of ancient volcanic eruptions which have since been subjected to prolonged denudation. West of Kingston, Ontario, the Trenton limestone occupies a wide belt extending to Georgian Bay. Over this lie the Utica shales and upon these the Hudson River formation upon which Toronto is situated.

The Laurentian plateau is composed of very ancient crystalline rocks. It has an area of over 2,000,000 square miles and, stretches in a horse-shoe form, open to the north, around the three sides of Hudson's Bay, south to the Provinces of Quebec and Ontario, east through the Labrador peninsula and west to the Arctic sea. Along its southern border run the great water powers and lakes and rivers of the St. Lawrence system, within its southern borders lie vast and valuable forests, northward are almost innumerable small rivers and streams which may constitute important water powers of the future. The average elevation of the plateau is about 1,500 feet and its surface features are of great geological antiquity—in Labrador reaching back to long before the Cambrian period. Its tendency is to be barren and rocky though there are many exceptions. The whole area of this system is not Laurentian. Huronian rocks are frequently met with as in the Sudbury and Temiskaming districts; and Cambrian outliers as in the vicinity of Port Arthur, and northwest of Chesterfield inlet on the west side of Hudson Bay. Of these the former produce gold-bearing veins, nickel and copper deposits and iron ores and the latter silver-bearing veins and iron ores.

The interior continental plain is bounded by parts of the Laurentian plateau, by the Arctic Ocean, by the Rocky mountains and by the southern border of Canada. Its southern part includes the famous prairie country of the north-west with a spread of some 193,000 square miles of open grass-land. Beyond the north Saskatchewan River this plain becomes a region of forest with occasional prairie tracts such as the Peace River Valley. This great plain, as a whole, slopes from the Rocky mountains toward the foot of the Laurentian highlands, over five

feet to the mile with correspondingly rapid rivers. There are certain lines of escarpment, however, such as the Red River Valley with the Winnipeg group of lakes, the Pembina mountains and neighboring hills, and the stretch of country which includes the Cypress Hills, etc. Scientifically, this central plain is regarded as a great shallow trough of which the western part, owing to post-Tertiary differential uplift is now higher in actual elevation than its eastern Laurentian rim. Since an early Palæozoic time its area seems to have remained practically undisturbed. The formations of this era have been largely covered by a later strata of the Cretaceous age composed chiefly of clay-shales and sandstones. They are distinctly marine in character and indicate the one-time existence of shallow seas. In Alberta there is a further layer of Larami strata which had an extensive flora and beds of lignite-coal. Over it all the glacial period has left superficial deposits.

Of the Cordillera there is a length of nearly 1,300 miles in Canada with a width of 400 miles between the plains and the Pacific Ocean. According to Dr. Dawson its strongly marked features result from enormous crustal movements parallel to the edge of the Pacific, by which its strata have at several periods and along different lines, been crumpled, crushed and faulted. These movements have continued at intervals to times geologically recent, and the mountains produced by them still stand high and rugged, with streams flowing rapidly, and with great erosive power, down steep gradients to the sea.

The Rocky Mountain range is largely composed of Palæozoic rocks with peaks sometimes rising 12,000 feet and an eastern boundary running down into the Cretaceous foot-hills which border the Plains. The Coast Range is the main western border of the Cordillera. Running northward from the estuary of the Fraser River for some 900 miles, with an average width of 100 miles, it passes inland and beyond the head of Lynn Canal. It is composed of granite with infolded masses of altered Palæozoic strata. Outside this Coast Range and in a partly submerged condition is the one of which Vancouver and Queen Charlotte Islands are projecting ridges. Its rocks are similar to the other, but include also masses of Triassic and Cretaceous strata. There is an interior plateau in the Cordillera running about 500 miles in length and 100 in width.

Minerals.—The geological formation of Canada is very bountiful in its distribution of minerals. The known resources are vast and varied, the discoveries of new and rich regions are numerous and constant, the possibilities of production in the future almost illimitable. Gold has been found in most of the Provinces and Territories but has not been mined to any great extent except in British Columbia, Nova Scotia and Yukon. The gold belt of British Columbia is a continuation of the great auriferous ranges of the Western States and, although production

was at first mainly of the placer kind, it has changed of late years into a substantial development of quartz mining. Since 1857, when the rush began from the famous fields of California to those of British Columbia, the production of placer gold in the province has totalled $67,772,703 in value and that of lode gold $36,385,058. During the placer period gold production ran between a total of $2,656,903 in 1862 to $1,046,737 in 1881. Between the years 1896 and 1905 it has risen steadily from $2,939,852 to $5,902,402. This increase is due to the increased tonnage of gold-bearing copper ores smelted in the Boundary district.

In Nova Scotia results and conditions have not been so marked. For more than 40 years gold has been mined there by machinery—no placers having been discovered. Since 1862 the production has totalled $16,728,319 or a yearly average up to 1904 of $389,000. In the Yukon placer production commenced seriously in 1897 with one of those historic rushes of reckless miners and adventurers which have made the history of mining so interesting. About a million and a half had been produced in fragmentary ways during the preceding decade but in the year mentioned the production rose with a bound to $2,500,000 and during the next seven years it totalled $106,025,000. Placer mining is the principal industry in the north end of the Territory and hydraulic machinery is being imported largely for the purpose of working these placers on an extensive scale. In the south end of the Territory, in the vicinity of White Horse and Conrad City, quartz mining has been the principal industry. The gold production of the Yukon has declined from $22,000,000 in 1900 to about $7,000,000, in 1905. Auriferous gravels are known to exist in the Chaudière River and its tributaries, in Quebec Province, and about $2,000,000 has been taken out in the past 60 years. Gold was first found in Ontario in 1866 but although it has since been discovered at various points for nearly a thousand miles along the northern Archæan formation of the Province—especially in the region lying to the West of Lake Superior—only $2,100,000 in all has been produced. Placer gold has also been found along the Saskatchewan River in the far West but no special development has yet occurred.

Next in value to the total Canadian gold product of $217,000,000 since 1862, and to the potential resources of the country in that respect, is that of coal which may be roughly estimated at a production of over $200,000,000 since 1874. In 1905 its total production for all Canada was $17,520,963 as against $14,610,395 worth of gold. Ontario and Quebec are almost devoid of this important mineral. In Nova Scotia and New Brunswick there are about 18,000 square miles of carboniferous rock but only a small portion contains workable coal seams. The best of these are in the former Province (about 635 square miles) and those of the Island of Cape Breton are remarkable for their number and thickness. The out-put of Nova

DOMINION OF CANADA
AND
NEWFOUNDLAND
Scale of Miles
0 100 200 400 600
ARCTIC OCEAN
PACIFIC OCEAN
ATLANTIC OCEAN
ALASKA
YUKON
NORTHWEST TERRITORY
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
NEW BRUNSWICK
NOVA SCOTIA
NEWFOUNDLAND
LABRADOR
PRINCE EDWARD ISLAND
GREENLAND
ICELAND
UNITED STATES
HUDSON BAY
BAFFIN ISLAND
BAFFIN BAY
DAVIS STRAIT
GULF OF ALASKA
GULF OF ST. LAWRENCE
Bering Str.
Halkett C.
Gwyder B.
Mackenzie B.
Melville Sd.
Lancaster Sd.
McClure Str.
Pr. Patrick Is.
Ringnes Is.
Melville I.
Banks Land
Bathurst I.
North Devon I.
Ellesmere Land
C. York
Melville B.
Upernavik
Disko I.
Disco B.
Umivik
Julianehaab
Godthaab
Frederikshaab
Fredericksdale
C. Farewell
Cumberland Sd.
C. Mercy
Resolution I.
C. Chidley
Hudson Str.
Labrador
Nain
Hopedale
Hebron
Okkak
Rigolet
Hamilton Inlet
C. St. Charles
C. Bald
White B.
Belle Isle
Placentia
St. Johns
Fortune
C. Race
Cape Breton
Sydney I.
Anticosti I.
Gaspé
Rimouski
Quebec
Montreal
Ottawa
Kingston
Toronto
Hamilton
Sudbury
Chicoutimi
Lake St. John
Fredericton
St. John
Halifax
Yarmouth
Portland
Boston
Prince Edward Is.
Gulf of St. Lawrence
St. Lawrence R.
Chapleau
Abitibi
Missinaibi
Moose Factory
James Bay
Ft. Albany
Ft. Severn
York Factory
Ft. Churchill
Nelson R.
Churchill R.
Winnipeg
Lake Winnipeg
Lake Manitoba
Lake Winnipegosis
Lake Nipigon
Port Arthur
Fort William
Rainy R.
Brandon
Portage la Prairie
Prince Albert
Saskatoon
Battleford
Calgary
Edmonton
Athabaska Landing
Strathcona
Lethbridge
Medicine Hat
Swift Current
Moose Jaw
Regina
Qu'Appelle
Prince of Wales I.
Somerset I.
Boothia Pen.
Gulf of Boothia
Cockburn Land
Fox Land
Melville Pen.
Hall Pen.
Baffin Land
Southampton I.
Coats I.
Mansfield I.
Salisbury I.
Resolution I.
Akpatok I.
Wager B.
Repulse Bay
Chesterfield Inlet
Baker Lake
Aylmer L.
L. Garry
L. Mackay
Dubawnt L.
Kathkyed L.
C. Eskimo
Mosquito B.
Ungava B.
Payne L.
L. Leaf R.
George R.
Koksoak R.
Hamilton R.
Ft. Chimo
Ft. Nascopie
Ft. George
Minto
Ft. Resolution
Ft. Laird
Ft. Wrigley
Ft. Good Hope
Ft. McPherson
Ft. Liard
Ft. Simpson
Ft. Norman
Ft. Providence
Ft. Smith
Ft. Fitzgerald
Ft. Nelson
Ft. St. John
Ft. McMurray
Ft. Graham
Peace R.
Athabaska R.
Great Slave L.
Great Bear L.
Great Bear R.
Mackenzie R.
Liard R.
Lake Athabaska
L. Wollaston
Reindeer L.
Nueltin L.
Kaminak L.
Yathkyed L.
Aylmer L.
Dubawnt
Chesterfield Inlet
Wager B.
Foz Channel
Victoria I.
Victoria Str.
Franklin Str.
Prince Albert Sd.
Kendall
Bathurst Inlet
Coronation G.
Kent Pen.
Richard
Liverpool B.
Parry Is.
Prince of Wales I.
Melville Pen.
Cumberland Pen.
Arctic Circle
Alaska Pen.
Kodiak I.
Bristol Bay
Alaskan Mts.
Mt. McKinley
Yukon R.
Tanana R.
Fairbanks
Ft. Yukon
Ft. McPherson
Dawson
Klondike Region
Selkirk
Whitehorse
Dyea
Skagway
Juneau
Sitka
Chichagof I.
Baranof I.
Prince of Wales I.
Ft. Wrangell
Ft. Nelson
Glenora
Ft. Simpson
Ft. Graham
Dixon Entrance
Port Essington
Port Simpson
Moresby I.
Vancouver I.
Nanaimo
Victoria
Vancouver
Westminster
Seattle
Tacoma
Portland
Columbia R.
Coast Ra.
Skeena R.
Kamloops
Okanagan L.
Spokane
Helena
Butte
Boise
Lead
Fargo
Duluth
Minneapolis
Pembroke
North Bay
Missinaibi R.
White River
English River
Nipigon R.
Abitibi R.
Mattawa R.
Ottawa R.
Gulf of St. Lawrence
Anticosti I.
Gaspé
Rimouski
Chaudière R.
Kennebec R.
Penobscot R.
Androscoggin R.
Merrimac R.
Connecticut R.
Hudson R.
Lake Champlain
Lake George
Lake Ontario
Lake Erie
Lake Huron
Lake Michigan
Lake Superior
Lake Nipigon
Lake Abitibi
Lake Temiscamingue
Lake St. John
Lake Manicouagan
Lake Mistassini
Lake Nipissing
Lake Simcoe
Lake Rosseau
Lake Muskoka
Lake Joseph
Lake Kenogami
Lake Metabetchouan
Lake Chicoutimi
Lake Bras d'Or
Lake Ainslie
Lake Huron
Lake Michigan
Lake Superior
Lake Nipigon
Lake Abitibi
Lake Temiscamingue
Lake St. John
Lake Manicouagan
Lake Mistassini
Lake Nipissing
Lake Simcoe
Lake Rosseau
Lake Muskoka
Lake Joseph
Lake Kenogami
Lake Metabetchouan
Lake Chicoutimi
Lake Bras d'Or
Lake Ainslie
Longitude West from Greenwich

Scotia has increased steadily from 1,177,669 tons in 1880 to 5,596,241 tons in 1904. From the western part of Manitoba (where there is a coal area of about 15,000 square miles) to the Rocky Mountains there stretches an area of coal beds some 60,000 square miles in extent and containing vast quantities of a useful though somewhat inferior production. The Northwest Territories, including Yukon, produced 614,445 tons in 1903. British Columbia possesses immense resources in this respect of which the chief production has, so far, taken place at the Nanaimo mines on Vancouver Island, at the Crow's Nest Pass Collieries around Fernie on the mainland, and at Canmore and Anthracite on the main line of the Canadian Pacific Railroad. It has been estimated by an officer of the Canadian Geological Survey that the Crow's Nest region alone would allow of 10,000,000 tons of coal being taken from it annually for 7,000 years without exhausting the supply.

The actual mineral resources of Canada, in other respects than gold and coal, are difficult to measure by past production. The chief products are copper, nickel, silver, lead, iron, and asbestos, totalling altogether some $16,000,000 in yearly value. Yet Ontario and British Columbia have enormous quantities of silver, developing in the former Province, through the sudden discoveries at Cobalt (q.v.) to a present production of $1,000,000 a month. Lead is found largely in British Columbia and that Province, with Ontario and Quebec, has quantities of copper, which the nickel developments at Sudbury in Ontario have increased the knowledge and production of. The nickel deposits of that region are the greatest in the world, while all the Provinces, notably Nova Scotia, Ontario, British Columbia and Quebec, possess extensive deposits of iron-ore, the chief factor in national success along industrial lines.

The ores of zinc, chrome, antimony and manganese, asbestos, graphite, appatite, corundum, mica, barytes, felspar and pyrites, exist in large quantities and with varied distribution throughout the country. Structural materials, represented by shales and clay for brick, tile and cements, limestones, sandstones and granite for building purposes, are found in abundance. Salt exists in immense quantities. Petroleum and natural gas are being discovered in new localities and peat exists widely distributed to an enormous extent, 37,000 square miles of deposits having so far been reported distributed over the different provinces and territories. The laboradorites of Labrador, the tourmalines and peristerites of Quebec, the jaspers and agates of Nova Scotia and Lake Superior, the perthites and sodalites of Eastern Ontario, afford handsome gem material, though it is not yet utilized.

The mineral production of Canada in 1905 was valued as follows: Metallic products, $37,150,830; non-metallic, $22,266,393; structural materials and clay products, $8,857,484. Value of products not returned, $300,000.

Total, $68,574,707. The production of minerals in Canada was $10,221,255 in 1886, showing an increase of $58,000,000 in 19 years.

Fauna.—The animal life of Canada is interesting though no longer a serious menace to the settler or the traveller. Wild game is plentiful but with a few exceptions not dangerous to the hunter. The herds of buffalo once roaming the western prairies in countless numbers are extinct with the exception of a few in the Mackenzie River Basin and those kept upon Government reserves. The wapiti and the elk are rarely met with though the latter is occasionally seen in the northern parts of Canada and on some of the Pacific coast islands. The stately moose and the astute caribou are still to be found in considerable numbers. The former has a habitat in the wilder parts of Quebec, in the forest regions of New Brunswick and Nova Scotia, in the Mackenzie River country, in Alaska and in parts of the Rocky Mountains. The latter may still be found, occasionally, in the thickly-wooded parts of Northern New Brunswick, Quebec and Ontario, the new Provinces and British Columbia. This species is the Woodland caribou. The Barren Ground caribou is found in the northern part of the continent and the adjacent Arctic islands. Rapidly decreasing from year to year in numbers are the Virginia deer and the black-tailed deer which are to be found in the far West, and on the Pacific coast. More rarely, the first-named may be seen in south-western New Brunswick and central Ontario and Quebec. The Rocky Mountain goat and the big-horned mountain sheep are plentiful in the ranges of British Columbia and as far north as the Arctic circle while the musk-ox still roams the Barren Grounds west of Hudson's Bay to the boundaries of Alaska. It is not found south of latitude 59°. Antelopes are native to the northern plains. So much for the Ungulata.

Of the Carnivora, the cougar, panther, puma and mountain lion are now rare though occasionally found in the rough-wooded parts of southern Quebec and, more frequently, in the Rocky Mountains. The wild-cat may still be seen in the older provinces though rarely; while the Canada lynx also finds a place in wooded country from the Atlantic to the Pacific, retiring, however, before the growth of population and in summer migrating through the Mackenzie River country toward the Arctic coast. Wolves still roam certain wooded parts of Quebec and Ontario and are found upon the unsettled western prairies in a comparatively inoffensive form. The Rockies is the habitat of the grey wolf, the Barren Grounds and the Arctic islands of the white wolf and the Mackenzie and Saskatchewan Rivers are, or have been, the habitat of the black wolf. Upon the northern plains, also, may be found the coyote, and the Eskimo dog finds a habitat in the far north. The red fox, silver fox, and black fox are native to all parts of Canada and are still plentiful where settlement is not too thick. The prairie fox is native to the

plains of southern British Columbia and Vancouver Island and the Kit fox to the prairies of Manitoba and the new Provinces. The Arctic fox, blue fox and white fox may be found on the northern shores and islands of the continent. The wolverine and carcajou may be occasionally met in the northern parts of Ontario and Quebec, though more frequently in the wooded parts of the west and near the boundary line of British Columbia.

The marten, weasel, ermine, mink, and otter are native to all parts of Canada while the badger is rapidly becoming extinct. The sea-otter is found on all the western coast of British Columbia and the raccoon in the older Provinces as far west as Lake Manitoba and in southern British Columbia. The grizzly bear is now confined to the mountains where it roams in decreasing numbers as far north as the Yukon while the black and the brown bear though native to all parts of Canada as far north as the limit of tree life are seldom seen within the bounds of settlement and civilization. The Barren Ground bear finds a place in the north while along the Arctic shores and islands the polar and white bears are still fairly numerous.

Of the Pinepedia various species of the seal are to be found on the West coast of British Columbia, upon the coast of Labrador, in Hudson's Bay, in the Gulf of St. Lawrence and in the Arctic Ocean. The walrus is confined to northern waters, and the sea lion to the shores of the North Pacific. Of the Rhodentia, the mouse is found in many parts of the country; the grey rat in the settled part and the black rat on the sea coasts. Others of this class are the lemming, the muskrat, the porcupine, the beaver, the red and grey and flying squirrels, hares and rabbits, the gopher, the chipmunk, and the hoary marmot, which may all be found in different portions of the country.

The bird life of Canada is quite a plentiful feature of its fauna. In 1814 the species of North America were described by John Wilson as numbering only 283 but in after years over a thousand species were estimated. Authorities record 317 different birds in Ontario of which 54 belong also to Quebec. *Dionne's Catalogue* gives 273 as the total for the latter Province. Amongst those best known to sportsmen throughout Canada are the ruffled grouse, the primated grouse, the black duck, wild geese and duck of varied types, snipe, quail, the golden plover and the curlew. Prairie chickens are innumerable upon the Western plains, waterfowl upon the Winnipeg lakes and the English pheasant is plentiful in British Columbia. Aquatic birds upon the great lakes, woodcock, snipe, etc., in Northern Ontario and the ptarmigan in Quebec are also to be found in numbers at certain seasons. Wild turkeys, the woodpecker, the sparrow, the thrush, wrens, hawks, owls, the partridge, humming-bird, jays, crows, gulls and terns are common to many and sometimes different parts of the country.

Insects are numerous but not specially notable, poisonous, or injurious. Moths and beetles of many varieties

bees, wasps, and ants, house-flys, mosquitoes, gnats and midges are common. The cockroach, cricket and grasshopper are found in certain seasons or places, and bugs, plant-lice, etc., are sufficiently plentiful. Snakes and serpents are not numerous or deadly in Canada and require little comment; the Amphibian fauna include innumerable frogs and toads and salamanders; the salt and fresh water fishes are referred to elsewhere.

HISTORY OF CANADA.

Name.—There are at least five suggested derivations for the name of Canada: (1) From the Algonquin word meaning 'welcome' and supposed to have been used by the Indians when they first met Cartier. (2) From the Iroquois word 'Canatha' meaning a collection of huts and applied by the Algonquins to their chief town. (3) From the Spanish word 'Acanada' meaning 'There is nothing there' and referring to the absence of gold on the coast of the St. Lawrence Gulf. (4) From the Portuguese word 'Canada' meaning 'narrow passage' and referring to the sudden and striking narrowing of the waters at Cape Diamond. (5) From Cordeiro's claim that the word is Basque for 'Canal' or narrow passage. The second suggestion is the popular one, but the fourth is the most probable. It embodies a fact quickly visible to explorers and sailors as well as to Indians and is a word common to both the Spanish and Portuguese languages, while it is said to have the same meaning as the Indian word 'Kebec' or Quebec—now applied to the Province through which the great river runs. It was first applied to New France; then to Upper and Lower Canada, which in 1841 were united as the Province of Canada; then by Act of the Imperial Parliament in 1867 to all the federated Provinces, present or future, as the Dominion of Canada.

Discoveries and Explorations.—Passing over the mythical traditions of Plato and Seneca, the Buddhist records of a Mexican visit, the Welsh traditions of the voyage of Madoc and even the more stable records of Norse invasion or Viking adventure, it is found that a Venetian sailing under the flag of England was the first to touch the mainland of America. John Cabot discovered and explored in 1497 the north-east coast—whether touching first at Labrador or Cape Breton is a moot point, with the bulk of authorities favoring the latter place. He was the first to plant the English flag upon the continent of America and was followed by a stream of explorers and navigators such as his son Sebastian who discovered Hudson's Bay in 1517; Jean Verrazano who discovered Nova Scotia in 1524 and Jean Denys, the discoverer of the Gulf of the St. Lawrence, in 1506. In 1534 Jacques Cartier passed along the shores of the future Maritime Provinces of Canada and explored the mouth of the St. Lawrence. During the succeeding year he named the famous Gulf and sailed up the river to the beetling crags of the future Quebec and the forest-crowned heights of what is now Montreal.

The history of the succeeding period is crowded with intrepid incident, the black shadow of individual suffering, and the gallantry of adventurous spirits of French and English extraction. The explorations of De Roberval in 1541, the visit of Sir Martin Frobisher to Labrador in 1576, the sighting of the Pacific Coast by Drake in the following year, the ill-fated expedition of Sir Humphrey Gilbert to Newfoundland in 1583 and the English acquisition of that Island, the De la Roche expedition of 1598, the colonization efforts of Chauvin and Pontgravé and the culminating explorations of Champlain in 1603 and succeeding years are the notable points in the record. The latter's efforts at settlement, his foundation of Quebec, his troubles with the Iroquois, his discovery of Lakes Champlain, Nipissing, Huron, and Ontario, his explorations of the St. Lawrence and Ottawa, his foundation of French domination in the New World, are the events of the years running from 1603 to 1635. Following this period Fathers Brèbeuf and Chauminot discovered Lake Erie in 1641 and Fathers Jogues and Raymbault located Lake Superior.

In the far West and North De La Salle in 1682 discovered and descended the Mississippi and in later years explored the regions around Lake Ontario, the Niagara River and Lake Erie. Father Hennepin is said to have been the first white man to gaze (1678) upon the magnificent loneliness of Niagara Falls. In the far West and North Father Albanel discovered James Bay in 1672 and De la Verandrye explored the sweeping prairies and saw the massive mountains lying between them and the Pacific in and about 1743. Captain Cook, in 1778, explored Vancouver Island and Sir Alexander Mackenzie in 1789 discovered the great northern river which bears his name and was the first white man to penetrate the Rockies and reach the Pacific Coast. In 1792 Captain George Vancouver explored the mainland coast of British Columbia while Simon Fraser in 1806-8 penetrated the Rockies of the future and discovered the Fraser and Columbia Rivers. Toward the end of the next century Dr. A. R. C. Selwyn explored the Valley of the North Thompson (1871) and the Peace River region (1875). Dr. George M. Dawson explored the Fraser River and coast Ranges (1875), the Queen Charlotte Islands (1878), Northern British Columbia (1879) and the Yukon Territory (1887); Dr. Robert Bell did a similar service to the Hudson's Bay region (1877), the Nelson and Hayes Rivers (1878-80) and the James Bay region (1895). Messrs. A. P. Low and R. G. McConnell were still later explorers in the North and West.

Indians.—The Iroquois or Five Nations, with whom Champlain first came face to face in his Canadian experiences were at once the best and worst of all the Indian nations. Their pride was intense and overmastering, their lust of conquest all powerful, and their savage passions and cruelties were vented in an indescribable degree upon their enemies. Yet in courage, con-

stancy and concentrated energy it would be difficult to find their equal as a people and, while they inflicted pain, they were equally ready to endure it. They included the Mohawks, Oneidas, Orondagas. Cayugas, Seneccas and afterwards the Tuscaroras, in what was practically a loose federation of nations stretching across the wide lake region and through what was destined to become the State of New York and the Provinces of Ontario and Quebec. In their day of greatest power the Iroquois warriors never numbered more than 4,000 men while it is probable that all the continental tribes and divisions of the Indian race never exceeded 200,000 at any one time.

There were two great original groups of the aborigines—the Malay-Polynesian and the Turanian. These groups were and are both represented in Canada, the Algonquins belonging to the former, the Iroquois, the Tinnehs and the Innuits or Eskimos to the latter. Through the Algonquins, Canada's aborigines are supposed to be connected with the people inhabiting the vast area from Malacca to New Zealand and from Madagascar to the Sandwich and East Islands. Through the Iroquois they are connected with the Finns and Tartars and Mongols of Asia and Europe. The two divisions are distinct. The Algonquin languages differed radically from those of the Iroquois both in grammatical and verbal forms. The flatter face, inferior stature and more delicately formed extremities of the Algonquin were in marked contrast with the muscular development of the Iroquois. The Iroquois was pre-eminently a landsman, a warrior and a lover of manly sports, while the Algonquin loved the water, was unaggressive and spent his spare time in idleness. Taciturnity, with all that it implies, such as the absence of humor, was characteristic of the Algonquin, but not of the Iroquois. The Iroquois was originally a sun worshipper but such the Algonquin never was. In fact, these two families had and have little in common beyond the mere accident of condition and certain minor features of life resulting from mutual intercourse.

The Innuits, numbering some 4,000 persons, are the oldest of Canada's aborigines and are said by Professor Boyd-Dawkins to be survivors of the cave men of the pleistocene period in Western Europe—an antiquity so great as to make the oldest of Egyptian annals seem modern. They live in the northern part of Canada from Labrador to Alaska. The Tinnehs—numbering 42,000—inhabit the valleys of the Athabasca, the Peace River, the region of the Great Bear Lake and the Mackenzie River, the slopes and coasts, or islands, of British Columbia. South of these are the Algonquins, numbering some 46,000, and divided into the well-known tribes of Salteux, Crees, Blackfeet, Bloods, Piegans of the West; the Micmacs, the Melicites and Abenakis of the Atlantic Provinces; the Narkapees and Montagnais of Labrador and Eastern Quebec; the Mississaugas, Ojibbeways, etc., of

Western Quebec and Ontario whom the French at times secured as their allies in the conflict with the Iroquois and the English. The habitat of the Huron-Iroquois was in a portion of what is now Ontario and they now number about 10,000.

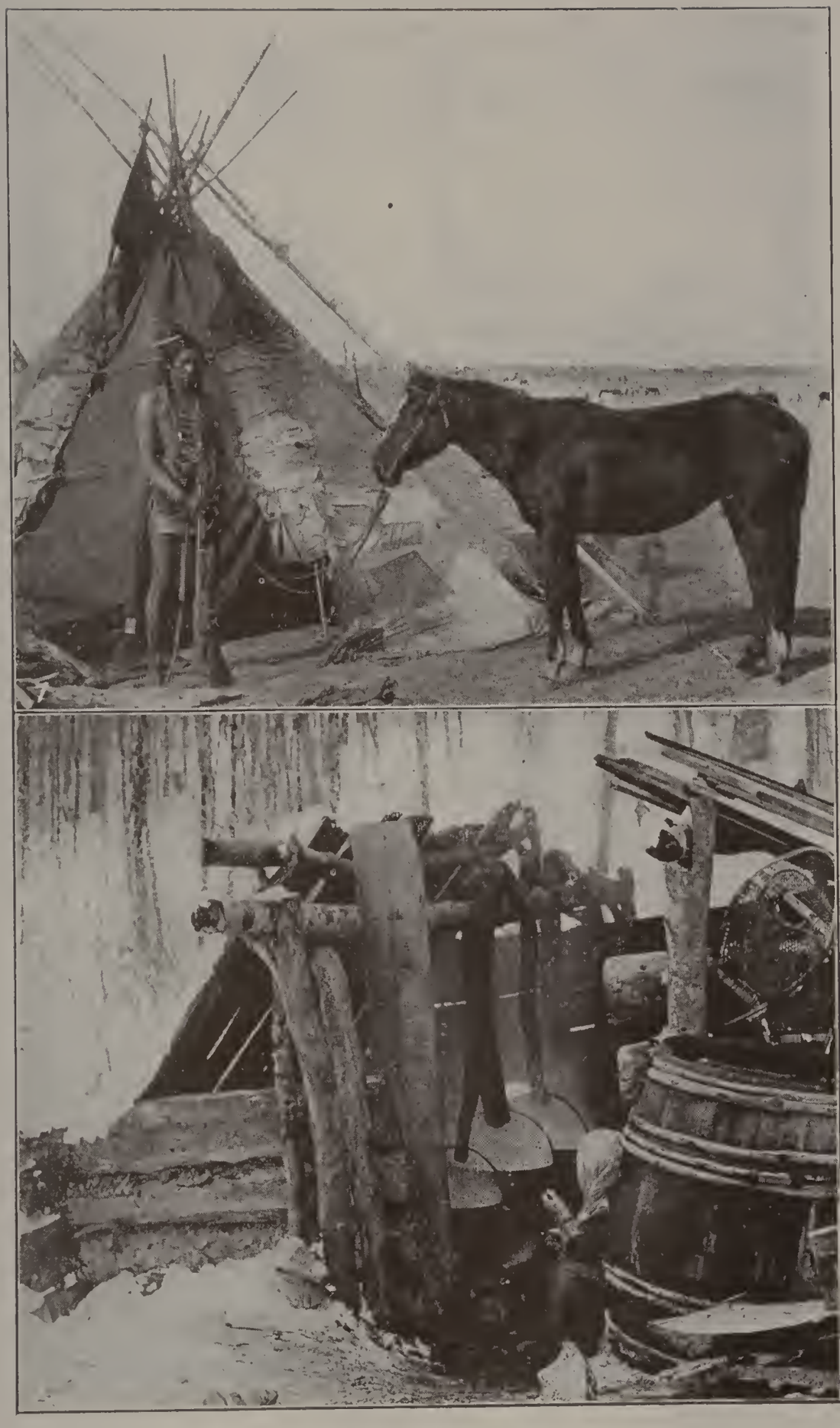
Canadian history in the 17th century was very largely a record of French missions and sufferings amongst the Indians; the attacks of savage races upon each other and the end of the long feud between the Iroquois and the Hurons by the practical extermination of the latter in 1648-9; the almost continuous conflicts between the French settlers in Quebec and the Iroquois masters of the forest. The latter struggle came to a head in 1660 when the Colony was only saved from destruction by the heroic efforts and final death of Dollard and his followers in keeping the Indians at bay until defensive preparations were made. In the French struggles with the Thirteen Colonies the Iroquois aided Frontenac toward the end of the century but in succeeding years under Debaudreuil, and afterwards, they were to be found chiefly in an alliance with the English which still held good when the Thirteen Colonies separated from Great Britain.

Meantime the conflicts with the French were many. In small detachments the Iroquois glided like shadows upon the settlers, villages became smoking ruins, while the remains of tortured victims stamped keen memories of pain over a wide area of French territory. De Courcelles' expeditions in 1666 against the Mohawks; Denonvilles' invasion of the Seneca country in 1867; the massacre of French settlers at Lachine in 1869; the Frontenac expeditions of 1693 and 1696, were the chief of these conflicts. During the next half century the Iroquois often held the balance of power between the French and English rivals and more than once used it greatly to their own advantage. The victory of Wolfe at Quebec ended this strife and the immediate result was a last despairing effort of the Indian to maintain his place and power. Pontiac, chief of the Ottawas, became the centre of a great alliance of tribes and in 1763 plunged the whole frontier of Canada in a blaze of savage warfare. Varied battles, burning villages, slaughtered settlers, marked the struggle until 1766 when Sir William Johnson finally forced the submission of the Indian leader. In the years which followed, the former, as English Superintendent of Indian affairs in the Colonies, obtained a vast influence over the savages and especially over the Iroquois of New York. When the Revolution broke out he espoused the Royal cause and the Indians joined in fighting faithfully for it under the leadership of Theyendanegea—Captain Joseph Brant. This Chieftain was another leader of the type of Pontiac but without his savagery of temperament and with some of the trained qualities of civilization. When the end came he led the bulk of the Iroquois Loyalists from their historic settlements to the banks of the Thames, in Upper Canada, and there they were supplied with land

grants by the King, and settled down in a life which was unbroken by war or strife until the days of 1812. Then once more they took up arms under Tecumseh and revived the old glories of their race, without the cruelties which had cast so black a shadow over its old-time records.

During the century that followed the War of 1812 there is no brighter page in the history of Canada than the wise and kindly treatment of its Indian wards—whether under British administration up to the middle of the 19th century or under purely local control in subsequent years. In the first Dominion Census (1871) the Indians of Canada totalled 102,358 in number and of these 23,000 lived by fishing, 18,000 in camps by prairie hunting, 17,358 in villages or settled districts, 44,000 by families in woods. The Indian population of Canada is changing very slightly, but has greatly increased in civilization and in industrial wealth. In 1902 the total value of their real and personal property was over $22,000,000 and they had a total income of $4,000,000. In 1901 the Indian population it was stated at 93,454 in the census of that year but the Official Report of the Department in 1902 put the figures at 108,112 and in 1906 at 109,394. Of this last total 23,728 were in the Province of Ontario, 11,307 in Quebec, 24,997 in British Columbia and 24,534 in Manitoba and the West generally.

The Jesuits.—The Order of Jesus had no small share in the pioneer life of Canada. The first missionaries of the Order arrived at Port Royal, Acadia, in 1611 and shared in the subsequent troubles between the French and the English Colonists. One was killed, another was sent adrift in an open boat and a third was captured by the Colonial force under Argall. In the present Province of Ontario the first mission was established amongst the hostile Hurons by Fathers Brèbéuf, Daniel and Davoust, near Penetanguishene, in 1640. Before that, however, the famous *Jesuit Relations* had commenced to be regularly transmitted from New France in the form of annual reports. Father Charles Lallemant wrote the first in 1632 and they were continued for many years afterwards by other writers amidst varying conditions of pain and privation. So far as Canada was concerned the Jesuits were pioneers of religion, and largely the pathfinders of territorial power. Over all the vast countries from the confines of the Hudson's Bay to the heart of the Mississippi Valley they carried with alternate failure and success the banner of the Cross. To these black-robed missionaries no self-sacrifice was too great, no suffering too painful, no hardship too severe, if but one savage child were baptized into the faith, or the passions of a solitary Indian modified by the influence of persuasion and the power of Christian hope. Especially was this the case in the country between Georgian Bay and Lake Simcoe—now a rich agricultural region of the Province of Ontario. Daniel Brèbéuf, Garnier, Garreux, Buteaux, Chabanet, were amongst the Jesuit missionaries who in these years



1. Blackfoot Brave and Pony.
2. Primitive Sugar Making, Quebec.

suffered martyrdom of the cruellest kind for the faith of their Church.

The only immediate result of this labor was the nominal conversion of the Huron nation—a people wiped almost out of existence by subsequent Iroquois raids. The ultimate result was some amelioration of the savage character in respect to tortures practised in time of war. That the marvellous work performed by these Jesuit priests was not more successful is due chiefly to the barbarism of the Christian rivals who were for a hundred years afterwards struggling for the possession of the continent. If, however, the labors of the Order of Jesus were fruitful of little amongst the savages of what is now Ontario but personal sacrifice and a prolonged tale of heroic sorrow, they were more effective amidst the scattered settlements of French civilization in the Maritime Provinces. Throughout historic Acadie, priests such as Fathers Biard and Massé worked long and earnestly with the settlers and the Indians. In centres such as Montreal, and Quebec, also, stately buildings of stone grew up emblematic of the ambitious policy of this and other religious Orders, while early in the history of New France self-sacrificing women such as Madame de la Peltrie, Marie de L'Incarnation, Mdlle. Mance and Marguerite Bourgeois helped in founding institutions of religion, charity and education. Thus it was that the policy of Richelieu—the establishment of a powerful French and Catholic state upon the American continent—was commenced; and it would probably have been consummated had statesmen such as the Cardinal and the gifted Colbert continued to rule in France.

Since those early times the Jesuits have always found a place in Quebec; their local wealth has become considerable; and their general influence is unquestioned. In 1800, as a result of European affairs in which their Order was concerned the British local authorities took possession of their property in Quebec. After prolonged efforts at recovery or indemnification the Order was incorporated by the Provincial Government, 1887, May 12; a measure was passed, 1888, July 12, granting it $400,000 indemnity under terms of an arbitration in which the Pope had officiated; and 1889, Sept. 26, after a fierce sectarian agitation in Ontario against this action, Parliament refused to ask for disallowance of the Provincial Act, at the hand of the Federal Government, by a majority of 188 to 13.

The Acadians.—Towards the close of the continental struggle between the French and English races occurred an incident which Longfellow has crowned with a halo of romance and history has marked as one of peculiar character and interest. The Acadians of 1755 were a people of many virtues—though these have perhaps been exaggerated. They were industrious, moral, and as a rule, peaceable. But they were essentially French in patriotism and policy despite the forty years, and more, during

which they had lived and multiplied in numbers, and prospered in position, under the British Crown. From the acquisition of Acadia (Nova Scotia, New Brunswick and part of Maine) in 1713, until the founding of Halifax in 1749, these French subjects had been treated with all generosity and forbearance. They were even permitted a special oath of allegiance which did not compel them to bear arms against the French of Quebec. But none the less were all their sympathies with the latter. In many this feeling was passive; in probably a majority it was active, while the most of them refused to take the modified oath. When, therefore, Fort Beausejour—a frontier post—was captured from a mixed force of French and Acadians in 1755 and an invasion of the Province was threatened from Quebec, with the probable support of many thousands of people within his own borders, Governor Lawrence took alarm and decided upon the determined measure which has made him, rather unjustly, one of the best-hated characters in Canadian history.

First, however, he called together deputies from the chief Acadian settlements, at Minas, Grand Fré and Annapolis, and warned them that their people must either take an unconditional oath of allegiance or be exiled. Nothing was done, however, and the people rested for a brief period in the ever-present hope that their fellow-countrymen in Quebec would succor them in the end. And then the order went forth. From far and near the hopeless and helpless families were brought to the sea-coast and placed, with their moveable possessions, upon vessels which bore them away to be scattered amidst the people of the Thirteen Colonies. From Pennsylvania to Georgia, and even in England and the West Indies, they could be found beginning life anew with every opportunity to mourn over the folly which had made them forget the stern necessities of a bitter and protracted international conflict. Every care was taken to prevent the breaking up of families, but it was inevitable that in the enforced exile of upwards of 6,000 people many incidents of extreme suffering should occur and that scenes of pathetic separation should be witnessed. Hundreds wandered back again only to find their homes destroyed or in the possession of others. As time passed, however, with a passionate love for their native soil they founded other homes within the bounds of historic Acadie and, in conjunction with those who had been willing originally to take the part of loyal citizens, became the root of a future population of 100,000 contented and prosperous British subjects. By this step, heartless as it has been deemed, Lawrence cleared his skirts of a hostile population which hemmed in the British settlements and hampered, where it did not paralyze, British policy and action in Nova Scotia.

French and English Wars.—Battles in North America from the beginning of the 17th to the end of the 18th centuries did not resemble military conflicts elsewhere.

No such splendid natural setting for the contest between France and England which belted the world was anywhere else provided. During much of the period when the respective Mother Countries were at war—and frequently when they were resting and recuperating during an interval of apparent peace—the broad aisles of the primeval forests of America, the stormy waters of immense inland seas, the untrodden mazes of an illimitable wilderness, constituted the environment of a determined struggle. These wars, so far as Europe was concerned, ran from 1689 to the Treaty of Ryswick in 1697; from 1702 to the Treaty of Utrecht in 1713; from 1744 to the Treaty of Aix-la-Chapelle in 1748; from 1756 to the Treaty of Paris in 1763. The history of the founding of Port Royal (now Annapolis, N. S.) by the gallant De Monts; the establishment of Montreal by De Maisonneuve (1642); the prolonged battle for existence by Quebec; the strife of Charnisey and De la Tour in Acadie; the gallant dash of Iberville Le Moyne upon the northern regions around Hudson's Bay and his destruction of English forts and ships; the expeditions against the English of New York organized by the brilliant mind and determined energy of Frontenac; the Acadian invasion by Sir William Phipps of Massachusetts; the sieges of Louisburg and Quebec and the oft-repeated struggles around Forts Niagara, Ticonderoga and Duquesne present some of the most tragic and dramatic scenes ever described in history.

Around and about the opposing forces echoed the war-whoop of the savage. Over the head of the beaten white man—French or English—rested the shadow of the scalping knife. The tramp of armed men and the roar of European guns were often preceded by the axe of the woodman and by paths cut through the depths of the forest in regions known only to the wandering Indian, the adventurous voyageur, or the occasional hunter and trapper. It was, in fact, a battle of giants in an area so vast and varied as to defy the knowledge or the imagination of the contestants themselves. Yet, even when the armies of Amherst had completed the victory of Wolfe upon the Heights of Quebec in 1759 and forced the surrender of Montreal, the French population of Canada did not exceed 80,000 as opposed to the New England Colonies with three millions of people backed by the might of England. For over 150 years New France had maintained a desperate struggle against serious odds and, at the last, the strange blending of martial spirit, aristocratic courage and religious enthusiam which had held half a continent for the Church and Crown of France was conquered as much by the miserable corruption of Bigot and other mercenary rulers as it was by the skill and vigor of the English.

Still the result was inevitable sooner or later. The military power of New France was never in a position to really cope with the organized forces of Old and New England. This was shown by the capture of Louisburg

in 1745. Frontenac might for a time hold both the Indians and the English in check; Montcalm might defeat his foes at Oswego, at Fort William Henry, and at Ticonderoga. But these incidents only illustrated the military skill and bravery of a prolonged struggle. They could not really compete with the slow irresistible movement of English colonizing strength or the irrepressible force of the English commercial instinct.

Canada and the American Revolution.—The end of the French and English struggle indirectly aided the evolution of the Thirteen Colonies into an independent republic by removing the necessity for loyalty and directly aided it through British statesmen, under stress of a heavy national debt caused by the conflict, launching into schemes of Colonial taxation. When the struggle came the Americans addressed a vigorous appeal to the French in Canada to join them but failed in the effort owing to the loyalty of the French clergy and seigneurs having been secured through the Quebec Act of 1774 which established a Legislative Council in the Colony and guaranteed to the people the maintenance of the French Civil law, the fullest freedom of religious worship and ecclesiastical influence, the security of property and civil rights to all religious orders.

In 1775 the invasion of Canada was carried out. Ethan Allen captured Forts Ticonderoga and Crown Point; General Montgomery captured Montreal and thence proceeded to Quebec where he was joined by another force under Benedict Arnold. The siege commenced Dec. 5 and ended 1776, May 6, in the repulse of the invaders, the death of Montgomery and the wounding of Arnold. In the summer General Carleton (Lord Dorchester) defeated Arnold in a naval battle on Lake Champlain and practically drove the Americans out of the country. The disastrous British expedition of Burgoyne into New York followed and in 1778 a strong but unsuccessful effort was made under the new alliance of France and the United States to again persuade the Quebec *habitants* to join the Continental cause. Finally the Peace of Versailles closed the war in 1783 and with the event went the Ohio Valley region and other territory which till then had nominally formed a part of Quebec.

The War of 1812-14.—The nominal causes of this struggle were simple and yet world-wide in their environment. During many years England had been facing the perils of Napoleon's stormy progress over Europe. On 1806, Nov. 1, Napoleon issued from Berlin, where he was newly installed as the victor of Jena and Austerlitz, the 'Decree' by which he declared the British Isles to be in a state of blockade and merchandise from England to be a prize of war. He, at the same time, arrogantly commanded the cessation of all intercourse with Great Britain by neutral nations. England naturally retaliated and, early in the following year, her Orders-in-Council proclaimed a blockade of the coast of Europe from Brest to Elbe and

declared all traffic with France in neutral vessels to be contraband and the vessels and cargoes as liable to seizure.

These proceedings affected greatly the large and growing carrying trade of the United States and, as Great Britain practically controlled the seas, it was from her privateers and men-of-war that the American shipping interests suffered the most. Hence the 'Non-Intercourse Act' of Congress in 1808, by which all commerce with either Power was prohibited until the obnoxious regulations were repealed. Another point in dispute was the claim made by Great Britain to search ships upon the high seas suspected of having deserters from the British Navy amongst their crews and of removing such as might be found. It was a claim which had for centuries been enforced as a right. Its assertion was now said to be necessary because of the enormous expansion in the number of British ships and because in 1805 it was estimated that at least 2,500 deserters of this kind—chiefly from merchant vessels—were in the American service. The practice was naturally unpleasant to the people of the United States. A minor cause for trouble was the publication of some unimportant correspondence between Sir James Craig, Governor-General of British America, and an adventurer named Henry who had been sent by him, rather unwisely though not unreasonably, to ascertain the condition of public opinion in the States. Henry reported a disposition on the part of New England to secede from the Union and then—finding himself unable to force money from the authorities at Quebec—sold his letters for $50,000 to the American Government.

These were the nominal causes of the war. Other causes were to be found in the smouldering embers of pre-revolutionary distrust and dislike; in the natural sympathies of many Americans with France since the days of Lafayette and of French aid against England; in the belief that the time had come for the acquisition of Canada and the unification of a continent; in certain political conditions entering into Madison's re-election as President. The war ended by the Treaty of Ghent, 1814, Dec. 24, in which neither of the chief causes of the struggle were even mentioned. It had commenced, practically, 1812, July 12, with General Hull's invasion of Canada and the issue of a proclamation calling upon the inhabitants to accept the new rule and support the cause of liberty.

On Aug. 8, Hull re-crossed the Detroit River and on the 16th surrendered Detroit to General Brock, the British Commander in Upper Canada, with 2,500 United States troops and much of cannon, arms and stores. With Detroit went the territory of Michigan. This event put spirit into the population of the Canadian Provinces and helped largely in maintaining the stubborn defence of the ensuing period. On Oct. 13 another success came to the British and Canadian troops when General Van Rensselaer's attack upon Queenston Heights was repulsed with

a considerable loss in killed and prisoners. On the other hand Sir Isaac Brock was killed.

A multitude of minor conflicts accompanied or followed these events. Tecumseh defeated an American force at Brownstown on Aug. 5; Dearborn and Smyth failed in some efforts with United States troops at the end of October; Proctor (British) defeated Winchester at Frenchtown, 1813, Jan. 21; Elizabethtown was captured by United States troops Feb. 6 and Ogdensburg by the British Feb. 23; York (Toronto) was captured and burned on April 27 and taken again on July 31; Sir G. Prevost made an unsuccessful attack upon Sackett's Harbor on May 29; Colonel Harvey (British) won a success at Stony Creek on June 5; Public buildings and stores were destroyed at Plattsburg by British troops on July 31; a British fleet under Barclay was defeated by the United States fleet under Perry on Lake Erie, Sept. 10; Proctor was defeated by United States troops under Harrison on the Thames and Tecumseh killed; the British and French-Canadian forces repulsed General Hampton at Chateaguay on Oct. 26 and British troops defeated United States forces at Chrysler's Farm, Nov. 11; Newark (Niagara) was burned by General McClure of the New York Militia, Dec. 10 and the United States Fort Niagara was captured by the British on the 19th and held till the close of the war. On Dec. 10 Lewiston, Youngstown, and other places were burned by British troops in retaliation for the burning of Niagara and on Dec. 21 Buffalo was captured and burned.

General Wilkinson was repulsed at Lacolle Mill in Lower Canada 1813, March 30, and on May 5 Sir Gordon Drummond captured Oswego. In July occurred the campaign of General Brown, who crossed from Buffalo and after a number of skirmishes was met at Lundy's Lane by Drummond and the British forces. A keen struggle resulted and has been claimed as a victory by both sides. Brown's forces, however, retreated to Fort Erie which the British unsuccessfully stormed on Aug. 15. On Sept. 11 the British fleet was defeated on Lake Champlain and Sir G. Prevost, with 12,000 men, retreated before a small American force. On Oct. 10, the St. Lawrence was open for service and on Nov. 5 the United States troops left Canadian soil in their evacuation of Fort Erie. Meantime, British troops had captured Washington and destroyed the capitol; American ships had won a number of victories upon the sea; a British force had endeavored to capture New Orleans and been repulsed with heavy loss. On Dec. 24 peace came.

Settlement, Immigration and Population.—The French population of Quebec, numbering in 1759 some 60,000, and the 40,000 United Empire Loyalists who came from the new American Republic into Upper Canada were the roots of Canadian settlement. No better foundation for a people could be conceived. Mixed with this French population of hardy, happy settlers and farmers along the

banks of the St. Lawrence, were the scions of many aristocratic families of France itself. Their Seigneuries were often insufficient to keep the large connection together and, as time went on, sons of the soil bearing the manners of monarchical France and the characteristics of the hunter, trapper, or voyageur of New France, would be found in varied paths of discovery and adventure through all the vast region to the north and west of the parent Province. Coupled with these influences of environment and nationality was the ever-present and potent force of religion, which in the form of a powerful and prevading Roman Catholicism became a most potent factor in moulding life and character. While limiting somewhat the mental activities of the French-Canadian it at the same time stereotyped in his character the light-hearted gaiety and irresponsibility of the Frenchman at home. And it conferred upon him also the inestimable benefit of a greater individual respect for law and order and religion than could have been reasonably expected from his particular national type.

To the regions around the great lakes and down by the sea the American Revolution drove a different kind of population. It was the better social element in a community which had gone through the pioneer stages of its existence and in which time and wealth had brought to the surface of society and government in the Thirteen Colonies a cultured, honorable and loyal class of men. They would have nothing to do with the Revolution and, in the end, gave up their homes, their property and wealth, their surroundings of culture and ease, to come into the vast forests of Upper Canada and Nova Scotia and to live there under a system of rule which would recognize loyalty and the institutions of their fathers, and at the same time give them greater liberty of thought and life. Judges, legislators, lawyers, physicians, gentlemen of means, mechanics and farmers poured into the British territory towards the end of the 18th century and laid the foundation of the British community of a century later.

As time passed on other elements came—especially in Upper Canada. The Americans from the Thirteen Colonies, who had sacrificed everything for the sentiment of loyalty, were followed by the Americans of a later day who saw possibilities of trade and land grants and growth in the new country. These people scattered themselves through the isolated communities and, on the rough and ready high-roads, kept taverns and in time adopted politics. They lacked fundamental loyalty, tried to stampede the Legislature into annexation at the outbreak of the War of 1812, and were summarily dealt with in several cases by British officers. They caused further trouble during the Rebellion of 1837 and in the injurious border raids of 1838.

In the 'twenties' came a mixed migration from England, Scotland and Ireland. It was of all classes and creeds. Army men—officers and soldiers alike—and

weavers from English towns; discontented laborers and Radicals of various localities in England and Scotland; the typical and ever-present younger sons of gentlemen; restless elements in the home population bred by the prolonged wars of the preceding period and the resulting peace; poured into the Province. With them came such individual types as Gourlay and Mackenzie and children such as the future Prime Minister and greatest of Canadian leaders—Sir John A. Macdonald. Out of this mixture of Loyalists and intense royalists from the original Thirteen Colonies; republicans and indifferent elements from the succeeding Republic; vigorous Radicals from the north of England and Scotland; loyal Highlanders such as those who settled Glengarry and parts of Prince Edward Island; Irishmen of the Orange type from Ulster and occasionally of the other kind from Munster and Connaught; army officers and men from various disbanded regiments; came the population of the English-speaking part of the country up to the end of the first half of the century. In the far West Lord Selkirk founded Manitoba by the Red River Settlement which he started in 1812 with 125 immigrants. The predominant white influence in all the vast regions stretching westward from Lake Superior was during three-quarters of the 19th century to be found in the personages of the Hudson's Bay Company, in the factors managing its trade and building its forts. It was not until 1871 that settlement there really commenced and it then proceeded slowly and steadily, until the beginning of the 20th century when a stream of British, American and miscellaneous settlers are pouring into the Canadian West in a total of over a hundred thousand a year. In 1881 the whole population of Manitoba was only 49,000, of British Columbia 65,000 and of the Territories 56,000.

The population of the older Provinces totalled little more than 400,000 at the beginning of the 19th century; in 1831 they were hardly a million. The population in 1871 was 3,635,024; in 1881, 4,324,810; in 1891, 4,833,239; in 1901, 5,371,315.

The increase in city and town population was marked all over the country. In 1891 the rural districts totalled 3,296,141 and, in 1901, 3,349,516 while the urban growth was from 1,537,098 to 2,021,799. According to the sexes and conjugal conditions the population showed a total of 2,460,471 males in 1891 and 2,372,768 females, while in 1901 there were 2,751,708 males and 2,619,607 females. The single or unmarried males in 1891 were 1,601,541 and in 1901 1,748,582; the single females, respectively, 1,451,851 and 1,564,011. The married males in 1891 were 796,153 and in 1901 928,952; the married females respectively 791,902 and 904,091. The British-born population, born in Canada, numbered 4,671,815; born in the British Isle 390,019; and born in other British possessions 15,864. The foreign-born population of Canada numbered 278,449. The popu-

lation in 1901, which had originally emigrated to the Dominion, was 684,671 in number and of this 404,883 were of British origin.

Political History and Development.—From the early conditions of French Canada, the Loyalist settlers of the other Provinces, and the later immigration of the 'twenties' there evolved political parties which made, or marred, the history of the first half of the 19th century. Loyalists and settlers of the gentry class from the Old Land, soldiers and ex-officers of the army, Highlanders and emigrants of Tory antecedents, strong Church of England supporters, Orangemen and the bulk of the professional class, formed the Tory party which dominated affairs until the days of the Rebellion of 1837 and Lord Durham's brief administration. Scotch and other Radicals from the old soil, Americans of republican sympathy or allegiance, office-seekers of good or evil type, discontented elements of all kinds, and men of more moderate view who objected to permanent Tory ascendency, formed the earlier Liberal party and the followers of Mackenzie in Upper Canada or of Reform principles in the Maritime Provinces.

Inextricably bound up with political questions and the character of the people were the religious or denominational rivalries of the time. The attempt to establish a State Church in Upper Canada and in the Maritime Provinces, though natural and even commendable from the standpoint of the original Loyalist settlers, was not very agreeable to later elements of Presbyterianism and Methodism. Members of the old Kirk of Scotland did not at first seriously object and Roman Catholics, who had a state system fully organized in Lower Canada, could not logically do so. But when Methodism came in from the United States and then from England and obtained influence amongst the lower classes of the community—as distinguished from the official and social class which was almost entirely Church of England in persuasion—it helped to force the eventual settlement and distribution of the lands reserved by Government for the maintenance of the Church of England and to compell recognition of the principle of equality under the law for all denominations in the English-speaking Provinces.

By this time (1854) the Seigneurial Tenure system in Quebec, or Lower Canada, had also disappeared, and with it the last official and formal link with feudal France. But people and parties in the French-Canadian Province, (with a single important exception) remained much as they were in the days of the conquest, through the period of that flash of folly called the Rebellion of 1837, and in the three decades following the Legislative union with Upper Canada in 1841. Excitable, sympathetic and easily moved the people were and always would be. Ignorant of much that was going on in the outside world, for good or ill, they were and are to-day. Prone to be led by flexible politicians with facile tongues they were and still are. But they were loyal, none the less, to the Church and

obedient to its wishes both political and religious—when firmly and clearly expressed; and so they remained, despite certain indications of possible change, until the general elections of 1896 when racial regard and personal liking for Mr. Wilfred Laurier overpowered the religious sentiment in favor of Manitoba separate schools. Easily satisfied in a financial sense, happy in the gaily colored interior of their little cottages, and ever cheerful amid the pleasant social environment of a peasant population which is knit together in a long and winding succession of small farms and closely-connected villages, they were then and still remain. In one regard, however, a great change had come over them. They were politically a different people. The prolonged discussion, fierce controversies and fiery agitations of the period between 1800 and 1840 had taught them by severe experience something of English constitutional methods and British liberty. It had been a serious struggle, and one into which such a people should never have been plunged.

To such a people a Parliament was at first a toy which they left to the English minority to control; then it became a powerful instrument to use against the small and to them alien population of the Province in an effort, natural under the circumstances, to make French in form and practice and rule the country of their birth and home. When the inevitable rivalries, arising between an English commercial and ruling class and a French agricultural community, fully developed, it was a matter of course that the Legislature should become a mere tool in the hands of designing or hot-headed Frenchmen, and that contest after contest between the people and their British Governors and English officials should culminate in the Rebellion of 1837—chiefly caused by racial prejudices and individual ignorance of what constitutional government meant. French agitators and many English-Canadians seemed to expect the French *habitants*, who had been bred under a system the exact antipodes of the British, to receive in a night the liberties and privileges which had taken the people of England centuries to successfully develop; and to put them into immediate and loyal operation. The result was a natural one and might have been expected. But, in the end, the people of Lower Canada did fairly grasp the principles of self-government, and it was this acquisition which makes the period under review so important in its influence upon their character and future political life. In 50 years they learned what Cromwell never knew, and commenced to really practice what slow centuries had taught the English people. Through painful experiences they learned that in a freely-governed community a racial majority should not be tyrannical, any more than a ruling minority, and that the first and highest principle of popular government is that of justice to all classes and creeds and races.

Meanwhile, in Upper Canada and the Maritime Provinces, and to a less influential degree in Lower Canada, the

great immigration of the middle of the century was taking place and the basis being laid for later political conditions. Hundreds of thousands of people poured into the Provinces from Great Britain and Ireland—changing the entire character of the country; clearing the still vast forests of the interior like magic; modifying in some cases and increasing in others the asperities of party warfare; building up the villages into towns and a few of the towns into cities; turning the isolated hut of the pioneer into the comfortably furnished home of a prosperous farmer. Corduroy or planked roads gave way to macadamized thoroughfares and then the whistle of the locomotive began to be heard in the land and steamers began to plough the great lakes and to pass through newly-constructed canals down the St. Lawrence and to Montreal or Quebec.

Trade between the Provinces developed and the first faint indications of a local or national patriotism as distinct from the wider impulses of Imperial loyalty, became visible. Parties in Upper and Lower Canada gradually, and sometimes imperceptibly, evolved upon other than the racial and religious lines which immediately followed the Union of 1841. Sir John Macdonald came to the surface of affairs and commenced his life policy of creating and maintaining a Conservative party which should combine reasonable and loyal French-Canadians with the Tories and moderate Liberals of the Upper Province, in an alliance against sectarian or sectional cries and against radical, or republican, or American, ideas and ideals. With the eventual success of this ideal came Confederation in 1867, the union of the Provinces by railways and commerce, the expansion of the Dominion to the waters of the far Pacific, the evolution of protectionism and its acceptance in 1878, the creation of a continental railway in 1886, the change of parties into two great national organizations, distinct—in the main though not entirely—from sectionalism and sectarianism.

When the first Federal Administration was formed in 1867 Sir John Macdonald was able, in a wider field, to practise his ideas of party organization and upon this policy turns the succeeding political history of Canada. He was unsuccessful in completely destroying party lines as his old-time opponent in Upper Canada—George Brown—after aiding in the creation of Confederation organized a new though not very strong Liberal party. But he did succeed in wiping out the old parties which had brought the Union of 1841 to a Legislative deadlock and had raised Protestantism and French-Canadianism into the position of paramount political issues in the united Province of Canada. He formed his Federal Cabinet out of a combination of Liberals and Conservatives. Sir Leonard Tilley, the Liberal who, as Premier of New Brunswick, had labored so strongly for Confederation; Sir George Cartier, who had helped the Rebellion of 1837 in Lower Canada and who now stood for the French race and his own Church; Sir W. P. Howland and the Hon.

William Macdougall who had been old-time allies of George Brown and supporters of a Liberalism which in those days looked upon Roman Catholicism as an advancing menace to the country only equalled in importance by the shadow of French-Canadian increase in numbers, joined hands with others in an attempt to place the new Dominion upon a level higher than either the races or the religions of its people. The result was the Conservative party of the succeeding thirty years led by Sir John Macdonald until his death in 1891; by successive Prime Ministers such as Sir John Abbott, Sir John Thompson, Sir Mackenzie Bowell and Sir Charles Tupper; by the Opposition Leader of 1901-6, Mr. R. L. Borden.

Liberalism under George Brown in Ontario and Sir A. A. Dorion in Quebec gradually grew in strength as the sectarian element was eliminated and as the leadership passed from the hands of Brown into those of Alexander Mackenzie. The Pacific Railway charges against the Macdonald Government in 1873 placed Mackenzie in power for five years with Edward Blake, Sir Richard Cartwright, Wilfred Laurier and others in his Cabinet. During the long period of Conservative rule which then followed the triumph of protectionism, or what was called the 'National Policy,' in 1878 and which lasted until Sir Wilfred Laurier's victory in 1896, the Liberal leadership passed from Mackenzie to Edward Blake and then to Laurier. In the Provinces strong Liberals early came to the front and captured the local Governments—Thomas Greenway in Manitoba, W. S. Fielding in Nova Scotia, Sir Oliver Mowat in Ontario, Sir Henri Joly and Honore Mercier in Quebec.

Gradually the Dominion Liberal party, in a spirit of hopeless and apparently helpless hostility to the wonderful personal dominance of Sir John Macdonald, drifted into a trade policy which looked dangerously like commercial assimilation with the United States; and upon this issue the Federal elections of 1891 had been fought and won by the Conservatives or—as they had cumbrously and curiously designated themselves since the period of coalition in 1854—the Liberal Conservatives. With the approach of 1896 the alien trade shadow had passed away from Liberalism and, aided by the complicated racial and religious issues of the Manitoba School question and by the party disintegration which had followed the death of the great Conservative Chieftain, Laurier carried his party into power in the Dominion for the first time in 18 years and found that the five principal Provinces were under Liberal control—a local condition which has since changed in Ontario, British Columbia, and Manitoba.

Parties in Canada have now no class basis such as existed in earlier days. Like the parties of the United States they have latterly appealed to the people in the main upon fiscal and railway issues. Between 1878 and 1896 they were also divided upon distinct lines of British and American development. Sometimes this did not

appear very clearly, although at times defined in political platforms; and it probably did not reach the perceptions of the public as a whole. But to the student and observer the issue was distinct. Sir John Macdonald and the Conservatives wished to build up a nation upon British lines and in closer and closer connection with Great Britain. The Liberal party wished to establish a nation upon lines of continental democracy and in closer and closer connection with the great expansion and trade interests of the United States.

The former evolved a policy of railway communication across the continent and steamship lines across the Pacific and Atlantic; a tariff policy which proposed to rigidly exclude American manufactures and would not, at any point, or under any circumstances, discriminate against British industries; a policy of participation in Imperial affairs by Conferences such as those of 1887 and 1894 and by a constantly expressed willingness on the part of its leaders to support aspirations towards closer union and to discuss and promote schemes of practical Imperial interest. In the Liberal party the opposite process was a peculiar, though not a permanent one. The aggressive loyalty of George Brown, the tenacious adherence to tradition of Alexander Mackenzie, gave place in turn to the curiously flexible and changeable opinions of Edward Blake and to the admittedly pro-American advocacy of Sir Richard Cartwright. Democracy was deified by the party, aristocracy scoffed at by many of its leaders and papers, royalty deprecated as a factor in national life, and many of the full-flavored principles of American or continental democracy apparently accepted. Perhaps unintentionally, but none the less effectively, this developed into what was naturally a strong Opposition policy to the British line of thought professed by the Tory Government and its followers.

It was a very natural evolution, and the only wonder is that with a press receiving all its external news from American cable agencies and a people fed by journalists and literature from the other side of the border in unlimited quantities, this movement, or under-current, did not grow greater in extent and influence. Unrestricted Reciprocity, Commercial Union, or Free Trade with the United States, and the apparently inevitable—though deprecated and denied—accompaniment of a continental tariff against Great Britain, became for a time the party platform (1889-93) and received continuous support from the pen of Mr. Goldwin Smith, the voice of Mr. Erastus Wiman, the political and Parliamentary influence of Sir R. Cartwright. In the United States, Congressmen Hitt and Butterworth were also unceasingly active. A change, however, came in Canada after the elections of 1891, and people of all parties seemed to recognize the consequences which might have ensued from the adoption of such a policy.

The Liberals, five years later, came into power, the

shadowing suspicion of this advocacy was removed, and they put into practical form the British sentiments of George Brown and Alexander Mackenzie. Democracy with them, as with the Conservatives, has now assumed a form suited to British allegiance and institutions. A national spirit has seized the minds of the masses and promises to drop into a British rather than an American mould. With this important political change came the new Government's organization and adoption of the Preferential tariff in favor of British goods and the products of many of the Colonies (1897); the participation of Canada in the South African war and the evidence of a strong Imperialistic spirit followed, however, by something in the nature of a reaction (1899-1901); the Alaskan boundary decision and the wide-spread discontent felt in Canada (1903); the inauguration of Mr. Chamberlain's fiscal movement and the great interest felt in its successes and failures by Canadians generally.

GOVERNMENT.

The Constitution of Canada is based on the Federal principle of a central government for the Dominion with Legislative Assemblies for the Provinces having authority to deal with local or provincial affairs. The Act which brought this constitution into effect is known as the British North America Act and was passed by the Imperial Parliament of Great Britain in 1867 and became operative on the first day of July in that year. It originally applied only to four Provinces viz., Ontario, Quebec, New Brunswick and Nova Scotia. Subsequently other Provinces were added as follows: Manitoba in 1869, British Columbia in 1871, Prince Edward Island in 1873, and Alberta and Saskatchewan in 1905.

Besides these Provinces, each having a Legislative Assembly or Parliament of its own, there are Districts lying outside of them—sparsely settled and so far removed from established systems of transportation as to be incapable of sustaining the necessary machinery of government. These Districts are: Ungava on the east coast of Labrador, extending westerly to Hudson Bay, and Mackenzie, Yukon and Franklin, lying between Hudson Bay and the Rocky Mountains. The Districts are subject to Police regulation by the Dominion Government, so far as it is necessary for the preservation of peace and order. In the case of the Yukon—large settlements having been made owing to the discovery of gold—a territorial government has been established with law courts and more or less of the routine of a Provincial Government, but without a separate Legislative Assembly.

Executive Government of Canada.—The Executive Government of Canada is vested in the King, represented by a Governor-General appointed by letters-patent under the great seal, who holds office during pleasure but who may exercise the functions of his office for six years. Following the course of responsible government as it prevailed in

CANADIAN STATESMEN.

1. Sir John Macdonald.
2. Sir Charles Tupper.
3. Hon. Joseph Howe.
4. Sir Wilfrid Laurier.
5. Sir A. T. Galt.
6. Lord Elgin.

Great Britain, the Governor-General has advisers known as Privy Councillors who have charge of certain specific departments of the Public Service and who constitute the Cabinet for the administration of the business of the country. The Governor-General has the right to assemble Parliament or to dissolve Parliament, to dismiss his Ministers or any one of them, to withhold his assent from any Bill passed by the Parliament. In short, his power is in all respects co-ordinate in Canadian affairs with that of the King in Imperial affairs.

The Cabinet.—The Cabinet consists of 14 members as follows: (1) The President of the Council; (2) The Minister of Justice; (3) The Minister of Railway and Canals; (4) The Minister of Public Works; (5) The Minister of the Interior including, (a) Dominion Lands, (b) Geological Surveys, (c) Indian Affairs and Immigration; (6) The Secretary of State; (7) Minister of Marine and Fisheries, including lighthouse service, coast-guard service, steamboat inspection, protection of fish and fish culture; (8) The Minister of Militia and Defence, including Militia, fortification and military schools; (9) The Minister of Finance, including Government Savings Bank and Audit; (10) The Minister of Customs; (11) The Minister of Inland Revenue, including excise, canal tolls, inspection of foods, gas, weight and measures; (12) The Postmaster General, including Post Office and Savings Banks; (13) The Minister of Agriculture, including the patent office, census and statistics, quarantine, experimental farms, Agencies for developing trade with Canada. The Department of Justice is aided by a Solicitor-General who is not of the Cabinet, but who acts as assistant to the Minister. His salary is $5,000 per annum. The President of the Council receives an annum salary of $12,000; the other Ministers $7,000 each. In addition, the Members of the Cabinet and the Solicitor-General draw an annuity of $2,500 as members of Parliament. On accepting office every Minister, who is not a Member of the Senate, has to go back to his constituency for re-election. The Ministers are assisted in the administration of their offices by trained deputies and the requisite number of clerks. The officials of the Government, called the Civil Service, do not retire on the defeat of their party, but hold office during good behavior, except in cases of offensive partisanship, which are very rare.

The Parliament of Canada.—The Parliament of Canada consists of a Senate and a House of Commons. The members of the Senate are appointed by the Governor-General on the advice of his Ministers and hold office during life. They are usually selected from men of experience in public life, or in business, and required to possess a property qualification of at least $4,000. In the event of bankruptcy or absence from a meeting of the Senate for two years, or conviction of crime a Senator becomes disqualified. The Senate is supposed to protect the Provinces against the encroachment of the popular branch of the Legislature and also to revise and reconsider the legislation

of the House of Commons. Its functions are similar to those of the British House of Lords. The Senate consists of 83 members and is presided over by a Speaker appointed by the Governor-General and conducts its proceedings according to business rules of its own framing. Owing to its quasi-judicial character, it is supposed to disregard to a certain extent the party issues so often involved in public questions.

The House of Commons.—The House of Commons consists of 214 members distributed, as nearly as practicable, according to a determinate unit of population over the whole Dominion. This unit of representation is ascertained as follows: The Province of Quebec is by the B. N. A. Act allowed a fixed representation of 65 members. After each decennial census the population of Quebec is divided by the number 65 and the result determines the unit for the other provinces. This unit, by the census of 1901, is about 25,000. Should the population of a province rise or fall, its representatives would be accordingly increased or diminished. British Columbia was allowed six members in the House of Commons when she joined the Federation, the number to be increased when the population unit would warrant it. But in no case was she to suffer a decrease. The new Provinces of Alberta and Saskatchewan are allowed an adjustment of their representation every five years and a census of these two provinces is taken quinquennially for that purpose. The representation of the Provinces in the House of Commons is as follows: Prince Edward Island, 4; Nova Scotia, 18; New Brunswick, 13; Quebec, 65; Ontario, 86; Manitoba, 10; Saskatchewan, 5; Alberta, 5; British Columbia, 7; Yukon, 1. The House of Commons elects a speaker at the beginning of each Parliament; that is after a general election; who holds office for the Parliamentary term of five years unless the House is sooner dissolved. The Speaker is entitled to be styled 'Honorable,' after his term of office expires. All Ministers enjoy a similar distinction. Any Bill, whether public or private may be initiated in the House of Commons but requires the approval of the Senate and the Governor-General before it becomes law. Appropriations for the Public Service can be initiated only in the House of Commons. When passed they constitute what is called the Supply Bill or the Estimates of Expenditure for the year. A Supply may be rejected in toto by the Senate but cannot be amended. The procedure of the House of Commons of Canada is based upon the procedure of the British House of Commons excepting that no provision is made for applying the closure on debate. The Session of Parliament lasts from four to six months each year.

Jurisdiction of Parliament—The powers of the Parliament of Canada and the Parliaments of the Provinces respectively, are defined in the B. N. A. Act. The Dominion Parliament deals with matters of national concern such as (1) The public debt and property; (2) The regulation of

1. Goldwin Smith.
2. Sir Wm. Dawson.
3. Sir Gilbert Parker.
4. Louis Frechette.
5. W. H. Drummond.
6. Chas G. D. Roberts.

trade and commerce; (3) The postal service; (4) The census and statistics; (5) Militia and military and naval defence; (6) Navigation and shipping; (7) Seacoast and inland fishing; (8) Currency and coinage; (9) Banking and paper money; (10) Patents of invention; (11) Copyright; (12) Naturalization and aliens; (13) Marriage and divorce; (14) Criminal law; (15) Penitentiaries.

The Provincial Legislatures have exclusive jurisdiction in regard to the following: (1) Taxation for obtaining a revenue for provincial purposes; (2) The management and sale of public lands and the timber and wood thereon; (3) The establishment and maintenance of Asylums, Hospitals and Public Institutions; (4) Tavern and shop licenses; (5) Lines of steamship and railways within the Province; (7) Public works of a local or provincial character; (8) Property and Civil rights; (9) The administration of justice within the Province; (10) Generally all matters of a local or Provincial character; (11) Education. In the matter of education the jurisdiction of the Province is limited by the B. N. A. Act so far as to prevent any Province from curtailing privileges and rights enjoyed by denominational schools at the date of the Act. The effect of this is to preserve to Roman Catholics separate schools in the Province of Ontario and to Protestants what are called Dissentient Schools in the Province of Quebec. It is nevertheless within the power of the Provinces to extend the privileges of their schools.

The Legislatures of the Provinces, with the exception of Quebec and Nova Scotia, consist of one chamber or deliberative body. In the Provinces named there is, besides the Legislative Assembly, an upper House called a Legislative Council. This Council in Quebec consists of 24 members appointed by the Lieutenant-Governor and in Nova Scotia of 19 members. The power of the Legislative Council is analogous to that of the Senate of Canada. The term of a Legislative Assembly in the majority of the Provinces is four years; but the Assembly has the right to adopt a longer term. In Quebec the Assembly has adopted a term of five years. The Legislature is subject to dissolution by the Lt. Governor as in the case of the House of Commons. The qualification of electors to the Assembly varies in the different provinces. Generally, manhood suffrage, with a residential qualification, prevails except in the provinces of Quebec and Nova Scotia where a small property qualification is required.

The elections to the House of Commons are based upon the same qualifications as elections to the Provincial Assembly. The vote is taken by secret ballot. In every Province stringent laws have been passed against corrupt and dishonest practices in elections and should the validity of any election be objected to the law provides for a trial before two judges of the High Court. Should the member elected be found guilty of corrupt practices by his own act his seat becomes vacant and a new election is held and such member would be disqualified to sit in Parliament

for some years. Should it be found that the election of any member was obtained through corrupt practices by agents his seat would be vacated and the member unseated would be at liberty to run again; but the convicted agents would be liable to a heavy fine, or imprisonment, or both.

Business of Parliament.—The Parliament of Canada, that is the Senate and the House of Commons, assembles at Ottawa, the capital, every year and is called by proclamation of the Secretary of State in the *Canada Gazette*. There is no statutory time fixed for its meeting, but the time at present agreed upon (1907) as the most convenient for members is in the month of November.

The Governor-General opens Parliament by an Address indicating briefly the questions which the Government regards as the most urgent for consideration. The Governor-General reads this address, first in English and then in French, to members of both Houses who, for the purpose assemble in the Senate Chamber, after which Parliament is said to be formally opened for the transaction of business. The address is considered by members who are opposed politically to the party in power. If the majority of the House of Commons disapprove of the address, the party in power retires from office and a new Government takes its place. This may involve a dissolution of Parliament and a general election as the new Government may determine; it always involves a change of Ministers and a substantial change in the character of the public questions which Parliament is asked to consider. It is in this way that party government makes itself felt in the direction of public affairs.

The business of Parliament is directed mainly by the Prime Minister and his Cabinet, aided by Committees of the House who report upon the various Bills introduced by private members and conduct enquiries on public matters submitted to them by the vote of Parliament. A similar course of procedure prevails in both Houses excepting that when the Prime Minister is a member of the House of Commons some member of his Cabinet, chosen by him for that purpose, directs the business of the Senate. Bills on any matter of public interest may be submitted by any member of either House to the body of which he is a member, with the exception of Bills affecting the revenue or involving the expenditure of public money. Such Bills can only be introduced in the House of Commons and by some member of the Government with the authority of the Governor-General. Bills introduced into either House are given what is called three readings, that is they must be considered at three different sittings, unless, in the case of emergency and with the unanimous approval of the members present. In such cases the three readings may be taken at the same sitting. At the conclusion of its business, Parliament is prorogued by the Governor-General with formalities, in nearly every respect similar to the procedure at its opening. The measures passed constitute the volume of statute law for the year, and are designated

by the year of the reign of the King or Queen on the throne of Great Britain at that time; as for instance 63 Vict. or 7 Edward means the statutes passed by the Parliament of Canada in the year 1900 and 1907.

The Revenue of the Dominion is derived from duties on imported goods and excise on tobacco, malt, liquors and spirits. The tariff, though moderate, affords reasonable protection to native industries. The Provinces receive from the Government an annual grant of eighty cents per head of their population with a small special grant for the administration of justice and the expenses of government. This income is supplemented by an additional revenue from the sale of timber, mining and tavern license, Railway and Corporation taxes, Succession or inheritance taxes, and other minor charges for administration. The Provinces have the power under the Constitution to raise a revenue by direct taxation or assessment, but so far the revenues from the above-mentioned sources have been sufficient for all public purposes. No explanation of the procedure of Provincial Legislatures is necessary further than to say that *mutatis mutandis* it is similar to the procedure of the House of Commons. Once a year it is assembled by proclamation in the *Gazette* for the province, opened and prorogued by the Lt. Governor, and its measures published as the volume of statute law of the province for the year.

Judicial Administration.—Owing to the connection between Canada and the British Empire, the right of Appeal to the Judicial Committee of the Privy Council has always been retained as the final Court of Appeal on questions large enough to engage the attention of such a court. Within Canada the final Court of Appeal is the Supreme Court, which holds its sittings at Ottawa and which consists of six judges, two of whom must be from the Province of Quebec—a provision intended to give the Court the assistance of men specially acquainted with French-Canadian law. An appeal lies to the Supreme Court from the Highest Court of final resort in Civil and Criminal matters in all the provinces, or of the Dominion, or on any Provincial matter of a constitutional character on which it is necessary to obtain a judicial opinion. The Exchequer Court consists of one judge appointed by the Governor-General. He has authority to hear and decide all cases in which the revenues or other property interests of the Crown are involved. He hears claims from the Dominion Government when any person suffers injury from the construction or operation of the public work and can award damages to such persons. The Dominion Government has conferred upon the Exchequer Court the power of the Admiralty Court to hear and determine all civil questions relating to contracts or wages and other matters arising out of navigation, shipping, trade and commerce in Canadian waters, tidal and non-tidal. A barrister of not less than seven years' standing may be appointed local judge in admiralty in such districts as may be necessary for the

convenience of the public. The judges of the Supreme Court, the Exchequer Court and all judges of the Provinces are appointed by the Governor-General on the advice of his Ministers and hold office during good behavior. They can only be removed on address to the Governor-General, passed by the Senate and House of Commons after full investigation into any charge that may be made against them.

MILITIA.

Authorized establishment 1906 was 2,725 officers, 30,320 men, and 7,702 horses; the total number trained during the year was 2,050 officers, 24,677 men and 6,626 horses. The expenditure upon Militia was $5,594,009 as against $3,953,-162 in 1904-5 and $2,413,651 in 1896-7. The militia is governed by a Militia Council of which the Minister of Militia is head. The Governor-General is Commander-in-Chief and there is an Inspector-General as well.

EDUCATION.

During the 19th c. education went through various stages of development. In Quebec it was at first a religious and ecclesiastical system, governed by priests and nuns and institutions under control of the Roman Catholic Church. Much of it was of the higher, or collegiate, type and intended primarily for the training of the religious teachers. The attempts at establishing a general school system prior to the Rebellion, in 1837, were tentative and feeble, even amongst the small English population; and such schools as were in existence met with disaster in the time of trouble immediately preceding and succeeding the insurrection. The teachers of the day were needy and illiterate, the supervision careless and dishonest, the school-houses dirty, and, in winter, very cold, the children unprovided with books, and the parents singularly indifferent. After the union with Upper Canada legislation of various kinds and degrees of value followed and, between 1853 and 1861, the pupils in Lower Canadian educational institutions of all kinds increased from 108,000 to 180,000 and the assessments and fees for their support rose from $165,000 to $526,000.

Meanwhile, the Roman Catholic religious bodies of the Province had increased greatly in educational strength and efficiency—especially the higher institutions of instruction. They possessed at least 2,000,000 acres of land, some of it in the heart of Montreal and other growing centres, which developed wealth by every year's growth of the country. Colleges for this kind of teaching were founded at Quebec, Montreal, L'Assomption, Joliette, Levis, Nicolet, Rigaud, Rimouski, Ste. Anne, St. Hyacinthe, St. Laurent, Rouville, Terrebonne, and other places. In 1854 Laval University was inaugurated at Quebec and later on was also established in Montreal. From its scholastic halls have come most of the rulers and leaders of French Canada since that time. Three years later Normal Schools were established for the train-

ing of teachers and in 1854 a Council of Public Instruction was organized with eleven Catholics and four Protestants in its membership. Out of this development came a common or public school system which slowly improved until, in 1875—eight years after Confederation, when education had been placed in the hands of the Provincial Governments—legislation initiated by M. de Boucherville, along lines which had been slowly evolved by Dr. Jean Baptists Meilleur and the Hon. P. J. O. Chauvean in two preceding decades, established the existing system.

At the present time this system is notable as having been created in a Province dominated by one race and religion and yet as being practiced in almost perfect fairness toward the minority. The Superintendent of Public Instruction has usually held office for many years in succession and has been fairly independent of political parties. The Catholic and Protestant elements of the population have separate Sections of the Council of Public Instruction and they administer the funds provided so as to suit the different ideas and ideals of their people. The Province boasts of seventeen colleges founded and maintained by the Roman Catholic clergy. It has had McGill University (opened 1843) as a centre of its English-speaking education during fifty years—much of the time under the administration and management of the late Sir William Dawson—and now developed into one of the great Universities of the British Empire. The standard of superior education in the Province is high; the standard of education in its more preliminary forms is improving; the teaching Orders of women who instruct pupils (numbering in 1905 more than 9,000) in domestic economy as well as in ordinary accomplishments, are doing most useful work; the number of children attending schools of all kinds has increased from 212,000 in 1867 to 335,000 in 1904.

In Upper Canada, or Ontario, there was no racial division amongst the people, but there were, at first, the inevitable difficulties of pioneer life, poverty of resource, and distance in space. Isolation and lack of money produced paucity of schools everywhere and poorness of teaching wherever they did exist. Dr. John Strachan, Bishop and politician and polemist, was practically the pioneer of education in Upper Canada. Out of his school at Cornwall (established 1804) came the leading men of the early days and from his conception of sectarian or Church of England education, came greater institutions of learning in Toronto—the Upper Canada College (1830), King's College (1827), which was afterwards secularized as the University of Toronto (1849) and Trinity College, which he then established in 1852 as an educational centre for his cherished Church.

Contemporary with him in part, and living and working after him, was Dr. Egerton Ryerson, the modern reorganizer of the public school system of Ontario, the vigorous and devoted champion of popular education, and of common schools. At first, in Upper Canada and

down by the Atlantic, as in Quebec, instruction in its simpler forms was greatly neglected. Long after the people had passed out of their pioneer position and the excuse of poor roads or no roads, and of poverty or lack of public organization, was removed from valid consideration, they seemed to remain indifferent, in all the English Provinces, to the education of children and to be much more inclined to lavish money and attention upon Colleges and higher branches of learning. The log schoolhouse of early days, the painfully inadequate accommodation for the pupils, the ignorant and somewhat intemperate teachers, remained public evils, in at least the two latter particulars, well up to the end of the first half of the century. Gradually and eventually, a change for the better took place. Dr. Ryerson worked wonders in Upper Canada. His School Act of 1850, followed by the establishment of Separate Catholic Schools in 1862, laid the foundation of the existing system which the sweeping legislation of 1871 altered greatly in detail without affecting seriously in principle.

In 1876 the important change was made of placing the Education Department in charge of a responsible member of the Provincial Government and, between that time and 1883, it was under the control of the Hon. Adam Crooks. His successor was the Hon. George W. Ross who held the position until his accession to the Premiership of the Province in 1899. Progress from the middle of the century onwards had been very marked. Between 1850 and 1871 the teachers in the public schools increased by 2,000 in number and the attendance of pupils by 100,000. Between the latter date and 1896 the teachers increased from 5,306 to 8,988 and the average attendance of pupils from 188,000 to 271,000. In 1904 the teachers numbered 8,610 and the average attendance of pupils was 227,165. The Roman Catholic Separate Schools included 944 teachers and an average attendance of 29,920 pupils. The High Schools and Collegiate Institutes numbered 138 with 601 teachers and 27,709 pupils. More important still, perhaps, the standard of education in Ontario grew better and better until the public schools were fully established in a position of equality with other departments of study and as part of a great educational chain in which the links were the elementary or public schools, the high schools, the normal schools for teachers, the Colleges and Universities.

Sectarian higher education had, meanwhile, grown greatly in population and power in Ontario. Besides the University of Toronto, which was secular in its control and construction, though originally sectarian, and Trinity College, which was Anglican in support and policy; the Presbyterians had started Knox College at Toronto (1844) and Queen's University at Kingston (1840)—the latter a notable institution in the concluding quarter of the nineteenth century under the control of Principal George Monro Grant; the Methodists founded

the Upper Canada Academy at Cobourg in 1836 and Albert College at Belleville in 1857. These institutions afterwards combined to form Victoria University of Toronto. Meanwhile the Baptists established McMaster University in Toronto (1887) and the Roman Catholics founded, in succession, Regiopolis College, at Kingston, and the University of Ottawa (1847) at Ottawa.

In the Maritime Provinces early conditions were very similar to those of Upper Canada or Ontario. There was the same poverty in school arrangements and paucity in teaching talent or training. There was the same indifference shown amongst the masses of the people toward elementary education and the same tendency among the rulers and upper classes to promote higher education and collegiate institutions. King's College at Windsor, Nova Scotia, was organized as far back as 1788; the University of New Brunswick was founded at Fredericton in the first year of the 19th century; Dalhousie University was established at Halifax under the auspices of the Earl of Dalhousie in 1821; Acadia College, Wolfville, was formed in 1838 as the educational centre of the Baptists and as a protest against the Church of England associations of all the other Colleges. Mount Allison College, Sackville, N. B., was founded by the Methodists in 1843 and the Presbyterian College at Halifax in 1820. In Nova Scotia, the Rev. Dr. Thomas McCulloch and in New Brunswick, the Rev. Dr. Edwin Jacob did continuous and splendid service to this cause of higher education. The elementary system developed more slowly, Nova Scotia possessed only 217 schools and 5,514 pupils in 1824, spent upon them less than $50,000 and voted down more than one measure for taxing the people in their support. In 1850, however, Mr. (afterwards Sir) J. W. Dawson was appointed the first Superintendent of Education in the Province. Progress then became more rapid and improved methods of teaching and plans of building were developed. He was succeeded in 1855 by the Rev. Dr. Alexander Forrester and, in 1864, the Hon. Dr. Tupper introduced in the Legislature of Nova Scotia his famous measure establishing free schools and a general public assessment for their maintenance. He fought the bill through successfully but the unpopularity of the direct taxation involved defeated him at the ensuing elections.

The system, however, was established and, under the succeeding management of the Rev. A. S. Hunt, Dr. Theodore H. Rand, Dr. David Allison and Dr. Alexander H. MacKay, became eminently successful. The number of teachers rose from 916 in 1865 to 2,438 in 1896; the average daily attendance of pupils from 23,572 to 53,023; the popular assessment for expense from $124,000 to $450,000; the Provincial grant from $87,000 to $242,000. In 1904 there were 2,353 public schools in operation with 2,441 teachers and an average attendance of 54,000 pupils. The Council of Public Instruction is composed of five members of the Government and the Superintendent of

Education is a non-political administrator of the Department under their control. Separate Schools have never been organized in Nova Scotia under Provincial auspices, although a working compromise exists and the Catholics have also an effective system of higher education with St. Francois Xavier College at Antigonish and the College of Ste. Anne at Church Point.

In New Brunswick, for many years after the beginning of the 19th century, teachers' salaries remained so small and the position was so undignified—as a result of the universal custom in pioneer Canada of "boarding around" at the houses of the school patrons so as to eke out the meagre remuneration—that good men would have nothing to do with the profession. As late as 1845 teachers' wages averaged $125 a year in this Province and much of that miserable sum was not paid in cash. In this year, however, matters seem to have come to a head, a committee of the Legislature was appointed to investigate the condition of education in the Province and two years later an effort was made to establish an organized system. In 1852 a Superintendent was appointed and in 1858 further legislation took place. But it appeared impossible to change the apathy and indifference of the people. Though they were fighting bitter sectarian wars over Universities and Test Acts and higher education they refused to take any interest in, or tax themselves for, the elementary teaching of their children.

In 1871, therefore, it was decided to establish free schools and compulsory attendance and to, at the same time, abolish all religious teaching. This later action was a distinct blow to the Catholic Separate Schools which had practically developed and was, of course, strongly resented by the people of that Church. The measure passed, however, and stands as clearly to the credit of the Hon. George E. King, then Premier of the Province and afterwards Justice of the Supreme Court at Ottawa, as does the preceding establishment of free schools in Nova Scotia to the credit of Sir Charles Tupper. The system is much the same as in the latter Province and has been presided over since 1871 by Dr. Theodore H. Rand, William Crocket and Dr. James R. Inch. From 1872 to 1897 the number of schools increased from 884 to 1,737, and teachers from 918 to 1,829, and the pupils from 39,000 to 61,000. In 1904 there were 1,747 schools, 1,815 teachers, and 56,198 pupils.

In little Prince Edward Island conditions were not different in early times from those in the larger Provinces and it was not until 1825 that its first Education Act was passed. The year 1852 saw the establishment of a free school system and, in 1860, the Prince of Wales' College was opened at Charlottetown. There were 121 schools in 1841 and 531 in 1891; 4,356 pupils in the former year and 22,138 in the latter. In 1904 there were 480 schools, 562 teachers and 19,031 pupils. To sum up the situation in these Provinces it may be said that everywhere prior

to Confederation similar conditions existed and everywhere the same beneficial results have followed the establishment of free schools, the formation of Normal Schools for the training of teachers, the taxation of the people for educational matters and their enforced interest in school affairs.

Development along these lines in the North-West and British Columbia was naturally an affair of comparatively recent times. Such education as there was in earlier days came through the devoted activities of pioneer missionaries such as the ministers of the Red River Settlement. Fathers Taché and Provencher, the Rev. John West, the Rev. Dr. John Black, and many others spread themselves in a thin line of labor and self-sacrifice over a vast extent of territory stretching to the Pacific Ocean. In Manitoba the system since 1890 has been a free school and an undenominational one. There were sixteen Protestant schools in 1877 and seventeen Catholic schools and, in 1890, these had increased to 628 and 91 respectively. Since the new system was inaugurated considerable progress has been made and in 1897, there were 1,018 public schools with an expenditure of $810,000. In 1904 there were 1,669 schools in operation, 2,218 teachers and 51,888 pupils registered. The system in the Territories included a Council of Public Instruction of a somewhat mixed character and of very recent formation. There were members of the Government upon the Council and four appointed members from outside—two Protestants and two Catholics. Progress was excellent, especially in view of the immense areas under Territorial jurisdiction, and the schools in operation increased, between 1886 and 1896, from 76 to 366; the enrolled pupils from 2,553 to 12,796; the teachers from 84 to 433; and Legislative expenditure from $8,900 to $126,000. On December 31, 1903, there were 16,321 pupils enrolled with 916 teachers. The two new Provinces of Saskatchewan and Alberta formed out of the Territories in 1905 were given educational institutions of very similar character but were restricted in the power to abolish Separate Schools.

British Columbia had practically no educational system prior to 1872. Up to that time both the earlier efforts of the Hudson's Bay Company on Vancouver Island and the later ones of the Legislature had been unsuccessful. The Public School Act of the year mentioned was amended in 1879, 1891, and 1896. There is a Minister of Education as well as a Superintendent of Education, but the general character of the arrangements are not materially different from those in other provinces. In 1872 there were 25 school districts which had increased to 193 in 1896; an average daily attendance of 575 as against one of 9,254; an expenditure of $36,000 as against $204,000. In 1904 there were 25,787 pupils enrolled in all grades with 624 teachers. There are a large number of Indian Schools in the Province under denominational control and,

though it is without a University, the Roman Catholics have two Colleges for boys and various Academies, while the Methodists have a College at New Westminster. The only University from Lake Superior to the shores of the Pacific is the University of Manitoba at Winnipeg. It originated, practically, from the Anglican Red River Academy of pioneer days and was organized in 1877 with University powers and as a federated institution which included St. John's College (the old-time Academy), Manitoba College under Presbyterian auspices, the College of St. Boniface under Catholic control, and Wesley College under Methodist guidance. Archbishop Machray, the Anglican Primate of Canada, was its Chancellor for many years.

LITERATURE.

Canada possesses a literature of which it may reasonably be proud. It has grown with the growth of the country and reaches its highest point at the present time when the Dominion also attains its greatest stature in external influence and internal strength. The beginnings of this literature lie back in the old French annals of discovery, travel and adventure. The chief of these works, reaching down to the bedrock of history, are the chronicles of Cartier's voyages; the similar narrative concerning Champlain; the histories, by Marc L'Escarbot and Gabriel Sagard, of DeMonts' settlements and of the Hurons, respectively; Father Louis Hennepin's *Canadian Discoveries and Voyages*; the famous *Relations Jesuites*; the semi-religious annals of Father Le Clerq; La Hontan's somewhat unreliable work of Travels; and the foremost and best of these early chronicles, the *Histoire et description Generale de La Nouvelle France*, by Pierre Francois Xavier de Charlevoix. Of course, the most abundant materials for the history of this period are to be found in the *Jesuit Relations*, but the six volumes by Charlevoix, first brought out in France in 1744, are the production of a clear, able and practised writer and as such are of the highest value. These works, taken together, constitute the basis of all historical literature in Canada and are therefore of great importance, although not written by Canadians—in the modern sense of the word. Equally important was the splendid series of volumes written by Francis Parkman and forming a veritable mine of brilliantly comprehensive history of early Canadian events and personages.

With the fascinating fur-trade period—the days of exploration and adventure in the far Northwest—came a further succession of works by outside pens. Sir Alexander Mackenzie's *Voyages*, published in 1802, La France's *Exploration of the Country adjoining Hudson Bay* (1744), Samuel Hearne's *Journey* in the same regions (1795), and Alexander Henry's *Narrative* (1809), are vivid reminders of the lives and labors of pioneers in a new country. So with the *Red River Settlement* by Alexander Ross (1856), Lord Selkirk's volumes and pamphlets upon the same subject, and Sir George Simpson's *Overland Journey*.

Following the earlier descriptive works of French and English writers came a series of volumes dealing with current events or conditions by men living at the time in British America, or travelling through its apparently boundless regions of lake and forest and wilderness. The most important of these, from an historical as well as descriptive standpoint, were Francois Maserés' constitutional and controversial publications; Major John Richardson's *War of* 1812 and *Eight Years in Canada* (1847); Mrs. Jameson's *Sketches in Canada* (1838); Colonel Talbot's *Five Years in the Canadas* (1824); George Heriot's *Travels* (1807) and those of Isaac Weld (1799) and John Lambert (1810); John Howison's *Sketches of Upper Canada* (1821), Sir R. H. Bonnycastle's *Excursions* (1849) and *Canada and the Canadians* (1846); Major G. D. Warburton's *Conquest of Canada* (1849), Galt's *Autobiography* and his descriptive work upon the Canadas; Sir George Head's *Forest Scenes in North America*; Captain W. Moorsom's *Letters from Nova Scotia* (1830), and Lieut.-Colonel Strickland's *Twenty-seven Years in Canada West.* There were some 50 other volumes of this nature published between 1852 and 1864 which could be mentioned and which helped to form a commencement along lines of literary life and thought. Sir W. H. Russell and Charles MacKay in general description, J. W. Kaye in his *Life of Lord Metcalfe,* Scrope's *Life of Lord Sydenham,* Waldron's *Life of Lord Elgin,* Wright's *Life of Wolfe,* might be specially mentioned.

For three decades following the period of war with the United States Canadian distinctive literary ambitions (apart from the contributions of visiting French or English writers) slumbered amid surroundings of pioneer activity. With the progress of settlement, the growth of the press, and the development of an easier life in cities or towns came, however, the gradual production of a strictly native literature. One of the earliest of these works, and perhaps the most important of all French-Canadian historical volumes, was the *Histoire du Canada* by Francois Xavier Garneau. Published in the years 1845-8, translated in 1866, and republished in 1882, this work is the accepted national history of the French-Canadian section of the population. It holds the place in their minds and hearts which Kingsford's greater and more elaborate work will take amongst English-speaking Canadians. Subsidiary to this in importance, but of much value, were Michel Biband's *Histoire du Canada* under the French régime (1843); *Cours d' Histoire du Canada,* by Abbe J. B. A. Ferland (1861-5); *Histoire de la Colonie Francaise,* by L'Abbe Etienne M. Faillon (1865-6); *Histoire des Canadiens-Francais,* by Benjamin Sulte; *Le Canada Sous l' Union,* by Louis P. Turcotte; *Histoire de la Rebellion de* 1837-8, by L. O. David; and various works by L'Abbe R. H. Casgrain and F. M. U. M. Bibaud.

Meanwhile literary progress in English-speaking Canada had been much slower and less productive. The competition of other interests and pursuits was keener and the

characteristic physical activity of the race greater. The natural result was comparative indifference to anything except political controversy, through the medium of popular journals, or the ever-present charm of English standard works. Hence the *History of Lower Canada,* by Robert Christie (1849-55), is one of the few works of importance written by English-Canadians during all these years. Another notable production was Gilbert Auchinleck's *History of the War of* 1812 (1855). Works upon the same subject were also written by David Thompson of Niagara, and Lieut.-Colonel W. F. Coffin, of Montreal. Dr. Henry H. Miles' *History of Lower Canada* must also be mentioned. Bouchette's *British Dominion in North America* (1831) was a most valuable topographical and statistical work, as were similar volumes published 20 years later by W. H. Smith. William Smith's *History of Canada up to* 1791 was a useful but somewhat one-sided work. D'Arcy Boulton, Q. C., published in 1805 a Sketch of Upper Canada while Bishop Strachan's *Visit to Upper Canada,* (1820), Robert Fleming Gourlay's *Statistical Account of Upper Canada* (1822) and William Lyon Mackenzie's *Sketches* (1833), possess value and interest. Mrs. Catherine Parr Traill published, in 1835, *The Backwoods of Canada,* and since then has written much upon the natural history and characteristics of the country. Her sister, Mrs. Susanna Moodie, wrote *Roughing it in the Bush* and similar works. The Rev. Dr. Adam Lillie published a valuable work entitled *Canada: Physical, Economical and Social* (1846).

With the coming of Confederation commenced a distinct development of literary activity in Upper Canada and the Maritime Provinces—almost the creation of a new literature. The Hon. Joseph Howe's *Speeches and Public Letters* and D'Arcy McGee's *Speeches and Addresses* were natural and early products of this period and illustrate that eloquence which in all countries takes its place in the permanent literature of the land. The chief historical work done in the ensuing decade was certainly that of John Charles Dent. Following or immediately preceding his works came John Mercier MacMullen's *History of Canada* (1855); Dr. W. H. Withrow's *History of the Dominion of Canada* (1878), and Dr. George Bryce's *Short History of the Canadian People* (1877) Beamish, Murdock, Duncan Campbell, Abraham Gesner, Andrew Archer, Alexander Munro and James Hannay meanwhile surrounded Haliburton's brilliant pen by historical productions of standard value concerning New Brunswick and Nova Scotia. Dr. William Canniff issued his work upon the *Settlement of Upper Canada* (1869), and Dr. Egerton Ryerson published *The Loyalists of America* (1881).

Meanwhile, the great Northwest had been coming into prominence and after its union with Canada in 1871 there grew up a mass of descriptive and historical literature. Not exactly native of the soil, but still instinct with the

life and progress of the prairies were a number of works published by travellers—some a short time prior to this date. Chief of these latter was *The Northwest Passage by Land*, by Lord Milton and Mr. Cheadle. Others of an aftertime were Captain (now General Sir) W. F. Butler's *Great Lone Land*; Stuart Cumberland's *Highway from Ocean to Ocean*; W. Fraser Rae's *Columbia and Canada*; Captain Huyshe's *Red River Rebellion*, and Charles Marshall's *The Canadian Dominion*. But this promising field was soon occupied by Canadians. Paul Kane wrote his *Wanderings of an Artist* (1859), Archbishop Taché published *A Sketch of the Northwest of America* (1870), and Principal Grant soon after issued his fascinating little book, *From Ocean to Ocean*. *The Prairie Province*, by J. C. Hamilton; *The Creation of Manitoba*, by Alexander Begg; *England and Canada*, by Mr. (now Sir) Sandford Fleming; *Canada on the Pacific*, by Charles Horetsky; the Hon. Alexander Morris's work upon *Indian Treaties*; *From Ontario to the Pacific*, by Mrs. Spragge, and *Mountain and Prairie*, by the Rev. Dr. D. M. Gordon; *Our North Land*, by C. R. Tuttle; *The History of Manitoba*, by Messrs. Gunn and Tuttle; and—most important of all to the seeker after general information—Professor Macoun's *Manitoba and the Northwest* (1882) followed. Four narratives of the second Northwest Rebellion were also written by G. Mercer Adam, the Rev. C. P. Mulvancy, M.A. Colonel, the Hon. C. A. Boulton and the Rev. R. G. MacBeth, respectively. In 1894-5 appeared the *History of the Northwest* by Alexander Begg of Winnipeg, and at the same time appeared the *History of British Columbia*, by Alexander Begg of Victoria—the pioneer work upon this general subject. *The Selkirk Settlement*, by the Rev. R. G. MacBeth of Winnipeg, a work upon the Indians of the Northwest by Dr. John MacLean, and narratives of pioneer missionary life by the Rev. E. R. Young and the Rev. George Young, must also be mentioned as of interest and value. To return to Ontario, W. J. Rattray's *Scot in British North America* showed great ability, and Nicholas Flood Davin's *Irishmen in Canada* was a work of unusual brilliancy. J. Edmund Collins wrote a *History of the Administration of Lord Lorne* which was marred by the constant intrusion of views peculiar to himself and fatal in their expression to any impartial presentation of current annals; while Dr. George Stewart published (1878) a well-written and standard work upon *Lord Dufferin's Administration*. William Leggo, of Winnipeg, was also author of a volume full of valuable documents upon the same subject.

Reference must be made to the School Histories of Dr. J. George Hodgins and J. A. Boyd, of W. J. Robertson, and Mercer Adam, of W. H. P. Clement and of J. B. Calkin, and of Emily P. Weaver. D. B. Read, K. C., wrote a number of biographical and semi-historical works. Dr. H. J. Morgan wrote much in the early modern period along lines of biographical and bibliographical work; Dr. Scad-

ding, J. Ross Robertson and others dealt with the history of Toronto, T. B. Aikins with that of Halifax, Dr. S. E. Dawson with that of Montreal and Sir J. M. LeMoine wrote the record of Quebec; County histories of more or less value were written by David Boyle, L. S. Channell, T. W. H. Leavitt, J. A. Macdonell, K.C., R. Sellar, James Croil, Hon. James Young, C. P. Mulvaney, Hon. Thomas White, etc. M. Faucher de St. Maurice, L'Abbe V. A. Huard, J. Edmond Roy, Arthur Buies, wrote latterly upon various subjects connected with French Canada. Edouard Richard's *History of the Acadians*; Colonel Ernest Cruickshank's *Studies of the War of* 1812; Dr. Douglas Brymmer's work at the Archives in Ottawa; the historical volumes upon Quebec by Dr. A. G. Doughty; the biographical, historical and edited works of J. Castell Hopkins, the literary and historical studies in many lines of Dr. S. E. Dawson; the constitutional volumes of Dr. Alpheus Todd and Sir J. G. Bourinot; the varied and brilliant writings of Dr. Goldwin Smith; all helped in constituting a mass of literary work which, while varying much in value and style, contributed to the creation of a Canadian historical literature. Nor must the names and work of George Johnson, R. E. Gosnell, Arthur Harvey, W. K. Reynolds, W. F. Ganong, Fennings Taylor, Hon. L. O. David, Joseph Tasse, S. J. Watson, D. A. O'Sullivan, Edmond Laureau and A. H. F. Lefroy be omitted from review.

For a young country, too, biography has found a considerable place, and the works of Joseph Pope on Sir John Macdonald, Hon. A. Mackenzie and John Lewis on George Brown, N. E. Dionne upon Champlain and Painchaud are important. The lives of Sir Brenton Haliburton, Logan, Ryerson, Archbishop Lynch, Bishop Strachan, Bishop Richardson, W. H. Merritt, Letellier de St. Just, Howe, De Maissonneuve, Rev. Dr. Fyfe, Faillon, Rev. Dr. McGregor, Rev. Dr. Bayne, Hon. H. Mercier, Bishop Provencher, Garneau, Brock, Simcoe, Tilley, Thompson, Chapleau, Bishop Burke, Rev. Dr. Burns, Hon. R. Cartwright, Sir J. R. Gowan, Colonel Fitzgibbon, Laval, Senator Macdonald, Rev. D. J. Maconnell, Rev. Dr. Wilkes, Rev. Dr. D. H. MacVicar, Lord Strathcona, Champlain, Wolfe and Montcalm, Sir W. Laurier, Sir Oliver Mowat, Principal Grant, Sir J. B. Robinson, Haldimand, Cartier, Papineau, W. L. Mackenzie, Talon, have all been written—sometimes in a sketchy manner, sometimes elaborately, sometimes interestingly, but all in a more or less useful way.

Turning to a lighter and brighter side of the general subject it will be found that romance has not held the place in Canadian literature which it should have done. Instinct as Canadian history is with a myriad themes of romantic interest, it has yet remained to the last few years for Canadian novels and novelists to find their way into the hearts of the reading public. The French-Canadians were the first to realize the brilliant possibilities of fiction lying in the gloomy aisles of Canada's primeval

forests; amid the sun-lit expanses of its rolling prairies or towering mountains; in the stirring and vivid pages of its national annals Eugene L'Ecuyer, Patrice Lacombe, Joseph Marmette, P. A. de Gaspè, Gerin-Lajoie, P. J. O. Chauveau, Real Angers each in turn contributed to the evolution of a romantic literature. But the public was limited, the appreciation not as pronounced as might have been desired. Perhaps the best of these volumes was *The Bastonnais* (1877), by Talon-Lesperance, and *Jean Rivard*, by Gerin-Lajoie. In Upper Canada amongst the earliest efforts in this direction was Mrs. Moodie's *Elora Lindsay*. In 1886 appeared the Canadian story, *An Algonquin Maiden*, by G. Mercer Adam and Ethelwyn Wetherald. In Nova Scotia Professor James De Mille published a number of stories which had a wide popularity in their day.

Professor Conant, by the Hon. L. S. Huntingdon and *For King and Country* by Miss Machar of Kingston followed, together with sundry novels and tales of Canadian life by Mrs. Leprohon, Miss Louise Murray, Mrs. J. V. Noel, Mrs. Annie Rothwell Christie, Watson Griffin, Mrs. S. Frances Harrison, W. D. Lighthall and others, which were usually published in the magazines or journals of the time. In more recent years clever short stories have been written by the Rev. Arthur Wentworth Eaton, Maud Ogilvy, C. L. Betts, the Rev. F. G. Scott, Stuart Livingston, Mrs. John E. Logan, Grace Dean McLeod Rogers, the Rev. Dr. W. H. Withrow, Miss F. G. Gwilt and F. Blake Crofton. But the central work of Canadian romance up to a few years ago, and one which will hold a permanent place, despite admitted faults of style, was William Kirby's *Le Chien D'Or* (1877). Sara Jeannete Duncan (Mrs. Everard Cotes) and Miss Lilly Dougall of Montreal also became well-known and Mr. Edmund E. Sheppard wrote three novels—notable for their clever character and dialect sketches—*Dolly*; *Widower Jones*; and *A Bad Man's Sweetheart*. Meanwhile, Charles G. D. Roberts became one of the best known of Canadian writers; J. Macdonald Oxley wrote much in the nature of boys' stories; Miss Joanna E. Wood published two notable novels; Mrs. S. Francis Harrison, in *The Forest of Bourgmarie* produced a work which showed dramatic power and much descriptive skill; while W. D. Lighthall, William McLennan, Edgar Maurice Smith and Miss Blanche Lucille MacDonald have also written stories which are a credit to the literature of Canada. Mrs. Henshaw—'Julian Durham'—of Victoria, B. C., and Miss Marshall Saunders, of Halifax, N. S., have, from the ends of the Dominion, produced novels of considerable merit.

Since the beginning of the 20th c. a notable school of new writers in fiction has come to the front. In Canada Wilfrid F. Grenfell, C. M. G., W. A. Fraser, Kate Westlake Yeigh, Rev. R. E. Knowles, Miss Agnes C. Laut, Miss Alice Jones, Agnes Maule Machar, R. L. Richardson, Hampden Burnham, A. R. Carman and Mrs. Verna Sheard, have published novels of which some will live in the per-

manent literature of the race. Following also the example of R. M. Ballantyne in earlier years Grant Allen, Robert Barr, Bliss Carman, Margaret M. Robinson, May Agnes Fleming, Stinson Jarvis and Sir Gilbert Parker went abroad seeking fame or wealth and, very recently, Norman Duncan, Harvey J. O'Higgins, A. J. Stringer, Elinor Glyn and others have won reputation in New York or London. In this latter respect Dr. William Osler has established himself, as have others in widely different lines of thought. Sir George Duncan Gibb, Bart., M.D., was a great medical writer; Dr. Beattie Crozier has won a high place in English science and literature. Montague Chamberlain is an American authority in the realm of natural history; the late Bishop Gillis, of Edinburgh, was a voluminous writer on Roman Catholic polemics; the Hon. Charles Wentworth Upham has written some standard works on local American history; John Foster Kirk has won eminence in the same country as an historian; Dr. George McCall Theal's is the most eminent name in the historical literature of Cape Colony.

In Poetry Charles Heavysege, Charles Sangster, Alexander McLachlan, William Kirby, John Reade, George Murray, Isabella Valancey Crawford, and Charles Mair hold the highest place among the earlier writers of English-speaking Canada. Others of the middle of the century who must be mentioned are J. J. Proctor, Isadore G. Ascher, Helen M. Johnston, Jennie E. Haight, Harriet Annie Wilkins, Pamelia S. Vining, William Wye Smith, Annie L. Walker, Rev. Edward Hartley Dewart, Prof. E. J. Chapman, Evan McColl, George Martin, Mrs. Susanna Moodie, John F. Macdonnell, Rhoda Ann Page (Mrs. Faulkner) and William Pittman Lett. New Brunswick poets of an earlier day were the Hon. Jonathan O'Dell and William Murdoch. Magnus Sabiston, of St. John, also wrote some clever verse and James De Mille found time amidst his novel writing for the publishing of some excellent poetry. So in Nova Scotia with Oliver Goldsmith, James Hogg, John McPherson, Thomas Knight and C. M. DesBrisay. For popularity and grasp of poetic dialect Dr. W. H. Drummond held a high place. Amongst other poets who must be mentioned of more recent years are Helen M. Merrill, John Stuart Thomson, A. H. Chandler and the Rev. C. P. Mulvaney, Kate Seymour MacLean, Arthur G. Doughty, Thomas O'Hagan, Rev. A. W. H. Eaton, John Henry Brown, J. A. Logan (Barry Dane), Mrs. Blewett, Bernard McEvoy, Hereward K. Cockin, and Mrs. S. A. Curzon. Still later writers are C. G. D. Roberts, Wilfrid Campbell, Arch. Lampman, J. W. Bengough, Carroll Ryan, Ethelwyn Wetherald, J. A. Tucker, E. Pauline Johnson, Clive Phillipps-Wolley, A. J. Lockhart, C. Gordon Rogers, Rev. F. G. Scott and Duncan C. Scott. Of these Campbell, Roberts and Lampman are the most notable and some of their work will rank with the best in the world. Among politicians the late Hon. Joseph Howe, Sir J. D. Edgar, the Hon. David Mills, Nicholas Flood

Davin and, especially, the late T. D'Arcy McGee have written some excellent poetry. R. F. Kernighan has become known by his nom de plume of 'The Khan' and some of his poems are so redolent of the farm and country life of the people and so instinct with the spirit of the soil as to merit a permanent place in Canadian literature. Arthur J. Stringer is another Canadian who has published isolated poems of great merit.

It is a far call from poetry to science and kindred subjects but in the latter department of literature Canada has excelled even many older countries. Sir William Dawson, Sir Daniel Wilson, Dr. A. R. C. Selwyn, Dr. G. M. Dawson, Sir William Logan, Dr. H. Youle Hind and Dr. T. Sterry Hunt rank high in the scientific world. Elkanah Billings, Prof. Henry How, Henry Poole, Prof. Henry H. Croft, George and James Barnston, the Rev. William Hincks and Prof. Charles Smallwood were voluminous writers in their day on subjects ranging from geology to meteorology. Professors John Watson and J. Clark Murray in Philosophy; Mrs. Catherine Parr Traill, Professor John Macoun and Dr. Alexander Milton Ross in natural history; the late Prof. George Lawson, James Fletcher and G. U. Hay, in botany, &c., have won a distinct place. Horatio Hale, Dr. G. F. Mathew, Dr. R. M. Bucke, Prof. E. J. Chapman, Prof. B. J. Harrington, Prof. R. W. Ellis, Prof. R. Ramsay Wright, Dr. Robert Bell, G. C. Hoffman, Dr. William Saunders, Prof. F. D. Adams, Prof. D. P. Penhallow, Dr. E. Gilpin, Jr., Prof. W. H. Pike, Rev. Dr. C. J. S. Bethune, R. G. McConnell, Dr. Loudon, late of Toronto University, Prof. H. T. Bovey, Prof. L. W. Bailey, H. M. Ami, Robert Grant Haliburton, Edward E. Prince, Dr. Neil MacNish and and Prof. John Campbell have all earned high reputations for scholarship or original research and for important publications connected with some branch or other of the field of science.

To ecclesiastical history and literature much has been contributed by Canadians, but only a few volumes of really first rank. Principal Grant in his *Religions of the World*; L'Abbe Auguste Gosselin in his *L'Eglise Du Canada*; Prof. William Clark in his *Life of Savonarola*; Dr. William Gregg in a *History of the Presbyterian Church in Canada*; M. Faillon in his great work upon the annals of Canadian Roman Catholicism—*L'Histoire de la Colonie Francaise*; have occupied high literary ground. Volumes of some value upon Church of England history have appeared, from time to time, by the Rev. H. C. Stuart, Dr. T. B. Akins, the Rev. A. Wentworth Eaton, F. C. Wurtele, Archdeacon Roe, Rev. Dr. John Langtry and S. Herbert Lee. The Rev. Dr. John McCaul wrote upon religious as well as classical subjects. The Rev. J. de Soyres wrote several interesting books. Presbyterianism has not been very productive in a literary sense, and its best known names are those of the Rev. Dr. James McGregor, Dr. Robert Burns, Dr. R. F. Burns, Dr. Alexander Mathieson, Dr. John Henkins, Principal Grant and Dr. Gregg. Dr.

William Cochrane wrote some interesting religious works, as did Dr. William Ormiston. The literary productions of Roman Catholicism include the works of M. Faillon and L'Abbe Gosselin in particular and much of the historical and poetic literature of French Canada in general. Its influence upon the development of Canadian culture has been upon the whole distinctly beneficial. Bishop Jean Langevin, Archbishop O'Brien, Mgr. C. Tanguay, Mgr. Tetu, Dean Harris, Mrs. Mary A. Sadlier. Rev. J. M. Coffee, J. K. Foran, Rev. Æneas McDonell Dawson, Rev. Dr. J. R. Teefy, Rev. J. B. Dollard and Thomas O'Hagan have largely contributed to the pages of Canadian Catholic literature.

There has been a very large and increasing mass of general literature in Canada—of books which can hardly be placed under distinct heads and yet which ought to be mentioned. E. T. D. Chambers by his descriptive works upon the sports and scenery of Quebec; F. Barlow Cumberland by his *History of the Union Jack*; and J. W. Tyrrell, in his popular *Across the Sub-Arctics of Canada*; have earned a place in Canadian literature. J. Hampden Burnham has published a useful book entitled *Canadians in the Imperial Service*. The Hon. J. H. Gray wrote one interesting volume of a proposed History of Confederation but never completed the work. During 1898 there appeared a most useful work upon *Steam Navigation in Canada*, by James Croil. Jehu Matthews, in his *Colonist and the Colonial Question* (1872) published one of the earliest works of importance upon Imperial Federation. Oliver A. Howland, in his *New Empire* afforded a most interesting review of the growth of existing Imperial conditions. Sir Sandford Fleming and Thomas C. Keefer, C. M. G., have written much upon questions connected with the material development of the country. So with Dr. George R. Parkin, C. M. G. Amongst miscellaneous Canadian authors a high place should be given to Lieut.-Colonel George T. Denison. Upon general military matters in Canada Lieut.-Colonel L. T. Suzor wrote much in the early sixties. A word may be said for the work of the Hon. J. W. Longley of Halifax in his little volume of essays entitled *Love*. The various educational works of the Hon. G. W. Ross of Toronto are also of a high order. During the last few years the names of D. M. Duncan, William Wood, Hon. A. B. Routhier, Rev. A. G. Morice, O. M. I., Lawrence J. Burpee, D. W. Higgins, A. D. DeCelles, N. E. Dionne, E. J. Chambers, J. S. Willison, and Hon. James Young, have come to the front in connection with publications of an historical or biographical character.

RELIGION.

The Protestant Churches.—There has been no more important factor in Canadian history than that of religious development. First in all the chief English Provinces was the Church of England. It was a dominant political power in earlier days, an influence for loyalty to the Crown, for education in the love of British institutions,

for adherence to rule by a governing Loyalist class, for devotion to the policy of British Governors. It held a high place in the government of the Provinces—not excepting Catholic Quebec prior to the rebellion; it had a strong interest in the stormy question of Clergy Reserves; it held a vigorous position in matters of education; it did much, in co-operation with the Roman Catholic Church, to found and formulate Western religious activities; it was for half a century the Church of the classes, the support of old-time Toryism, the strength of a social system which was not without benefit to a new community amid crude conditions of life.

The Methodist denomination had a pronounced place in the hearts of later settlers from the United States and the United Kingdom. It was the early root and home of Canadian radicalism, the centre of opposition to Toryism, the embodiment of steady and severe missionary labors, the cause of bitter political controversy in educational matters and in such political issues as the Clergy Reserves (q.v.). It held intimate association with American Methodism and, up to 1812, the greater part of its ministers were from the United States while its policy and principles and preaching were also American in style and, frequently, in advocacy and patriotism. After the war, when many of its pulpits were vacated by American citizens returning to their own country, the English element became predominant and, in 1828, the Canadian Methodist Conference was finally declared independent of the American Church. It had many ups and downs after this time and was divided upon political issues in later years by Dr. Egerton Ryerson, but always and everywhere in the Provinces, it continued to exercise a strong influence in public affairs.

Presbyterianism was never such a political factor in Canada as were the three divisions of Christianity just referred to. Its policy was too severe in tone and practice and its ministers too conservative, in a non-partisan sense, to constitute what might be termed a semi-political denomination. Methodism was essentially a militant and missionary element in Canadian history; Presbyterianism was more of a strong, pervading influence among men of a single nationality. Its divisions were not so numerous as in the other case and, prior to the Disruption in Scotland, the 'Kirk' often stood side by side with the Church of England as a silent factor for the preservation of old traditions and in simple antagonism to democratic innovation. The chief political issue with which it was mixed up was that of the Clergy Reserves, just as the one public question in which the strong Baptist denomination of the Maritime Provinces was concerned was that of secular denomination.

In all these religious divisions the controversies of the Old Land were reproduced with more or less fidelity. The Church of England factions disputed, in the latter half of the 19th c., over forms and ceremonies of High

or Low Church practice just as they did in England. Methodism was divided into the Primitive Methodist Church, the Bible Christian Church and the Wesleyan Methodist Church, while its American affiliations and Canadian position brought into existence the new Methodist Episcopal Church and the Methodist New Connexion. Presbyterianism had its Church of Scotland in Canada; its Free Church Synod, and its Presbyterian Church of the Lower Provinces; its United Presbyterian Church and its Canada Presbyterian Church.

If, however, the denominations shared in the shaded differences of thought and creed which came to them from the Old Land, they also shared immensely and beneficially in the financial benefactions of the British Churches and of the great missionary Societies, while the Church of England received large sums from the British Parliament well on into the 19th c. Up to 1833, when a gradual reduction commenced, the Imperial Parliament granted $80,000 a year for the maintenance of this Church in British America and many other sums were paid from time to time. The Society for Promoting Christian Knowledge was indefatigable in its missionary work and spent large sums in extending the Episcopate, endowing missionary clergy, and aiding struggling parishes in the different Provinces. The Society for propagating the Gospel was more than a benefactor, it was almost the parent of the Church of England in Canada. Its expenditure between 1703 and 1892 in British America was $8,930,925 and from 1820 to 1865 its annual expenditure seldom went below $100,000. The Church Missionary Society was another staunch supporter of Anglicanism in Canada. The various Methodist Churches were also largely aided by funds from London, and their early English missionaries were almost entirely supported from that source. So with the Presbyterian denomination and the well-known Glasgow Colonial Society and its practical work between 1825 and 1840. There were a few great men among the missionary founders and pioneer leaders of the Churches; there were many admirable men in character and capacity and self-sacrifice. The Church of England was led in Quebec by such heroes of the missionary field as Bishop Jacob Mountain, Bishop George J. Mountain and Bishop Charles James Stewart and by such religious organizers as Dr. Williams and Dr. Fulford —the latter the first Metropolitan of Canada. In Ontario, the Rev. John Stuart and the strenuous personality of Bishop Strachan, were prominent. In the Maritime Provinces Dr. Charles Inglis was the first of all Colonial Bishops and his See for a time included the whole of British America. Dr. John Inglis, Bishop of Nova Scotia, Dr. Binney, also Bishop of the same Province, and Dr. John Medley, Bishop of Fredericton during 47 years, worked successfully for their Church. So with Bishop Anderson and Archbishop Machray in the far-away Territories, Bishop Sillitoe in British Columbia, and W. C. Bompas in the distant Yukon.

Methodism in Canada boasted pioneer laborers such as William Case, James Richardson, Henry Ryan, John Reynolds, John Davison, Egerton Ryerson, John Carroll, Anson Green, William Black—men of immense energy, deep spiritual enthusiasm and the highest powers of endurance. In later and quieter days there were scholars and orators such as Dr. Matthew Richey, Dr. Enoch Wood, Dr. William Morely Punshon, Dr. George Douglas, Dr. S. D. Rice, Dr. J. A. Williams, Dr. Albert Carman. Presbyterianism in its *personnel* hardly had the same pioneer variety of attainment, except in the cases of Dr. James McGregor in Nova Scotia, Dr. John Cook in Quebec and Dr. John Black in the far West. In later days men of great ability or learning, such as Dr. Alexander Mathieson, Dr. Robert Burns, Dr. Alexander Topp, Dr. John Jenkins, Dr. William Reid, Dr. William Gregg, Dr. J. M. King, Dr. William Caven and Dr. George M. Grant appeared on the scene.

But it is in the new Canada lying West of the Great Lakes that the churches, Catholic and Protestant, have found the widest field for missionary enterprise as well as for heroism and self-denial, less spectacular perhaps, than that shown in the early days of Canadian history, but no less real. In this work of supplying the new country with religious privileges the Protestant denominations have exhibited a generous rivalry and have all played no unimportant part in the establishing of this young nation in righteousness. It is largely owing to the fact that the Christian Church has had a large share in laying the foundation of the nation in the country lying west of the Great Lakes that there never has been and never will be a wild west in Canada.

To the Church also belongs the honor of opening up the country for settlement, of making known its resources and of awakening interest in Western Canada among the people of the older provinces and Great Britain. To the Church also, more than to any other agency, is due the credit for the encouragement of the best type of settlers by offering the assurance that in the new and remote settlements there would be provided for themselves and for their children those religious privileges which people of this class prize above all other.

The Baptist Churches found their best field of growth in the Maritime Provinces. Missionary work was commenced in Nova Scotia by the Dimocks in 1760 and received a great impulse from the labors of Henry Alleine some 20 years later, whose propaganda aided both Congregationalists and Baptists. In Quebec the first Church was established near the Vermont border in 1794 and much work was afterwards done by the Massachusetts Missionary Society. In 1819 an Upper Canada Association was formed including Churches at Toronto, Brantford, etc. In 1897 there were 405 Churches in the Maritime Provinces and 496 in the rest of Canada. Horton Academy, afterwards a part of Acadia University, Wolfville, N. S.,

became in time the recognized college of the denomination in the Maritime Provinces as did McMaster University of Toronto for these of Ontario. The outstanding figures in Canadian Baptist history are those of Rev. Dr. Charles Tupper and Rev. Dr. R. A. Fyfe. According to the census of 1901 there were 316,477 Baptists in Canada as compared with 302,565 in 1891, 275,291 in 1881 and 227,898 in 1871.

Congregationalism in Canada has not been a large denomination though an enthusiastic and self-sacrificing one. Its first work was commenced in Quebec City in 1801; a little later a congregation was founded at Frome in Ontario, as 'The Congregational Presbyterian Prince of Peace Society.' The pioneer in the Maritime Provinces was Henry Alleine who founded a number of what were called 'New Light' churches about 1776 and revived other congregations established as early as 1760 and 1761. The first Western work was done by Rev. Wm. Ewing at Winnipeg in 1879. The Rev. Henry Wilkes of Montreal was the most prominent man of modern Congregationalism in Canada, and to him, chiefly, the Montreal Congregational College owes its existence. According to the Census of 1901 there were 28,293 Congregationalists in Canada as compared with 21,829 in 1871. In addition to the large denominations Canada possesses a great variety of smaller ones or sects. The 1901 Census showed 8,058 Adventists, 12,316 Christian Brethren, 10,407 Buddhists, 15,630 Greek Catholics, 2,619 Christian Scientists, 5,115 Confucians, 14,900 Disciples of Christ, 8,775 Doukhobors, 10,193 Evangelicals, 4,100 Friends (Quakers), 2,775 Hornerites, 16,401 Jews, 6,801 Latter Day Saints, 92,524 Lutherans, 31,797 Mennonites, 15,107 Pagans, 10,308 Salvation Army members, 1,934 Unitarians, 4,701 United Brethren, 2,589 Universalists. Of the entire population 33,023 were recorded as of 'Other Sects' than those enumerated, and 43,221 as 'not given.'

The Roman Catholic Church.—The history of the Roman Catholic Church in Canada naturally starts with Quebec, which was erected into a Vicariate-Apostolic in 1657 and into a diocese 1674, Oct. 1, with Rt. Rev. Francis de Laval-Montmorency as first Bishop. At the time of its erection the Diocese of Quebec stretched from the Gulf of St. Lawrence to that of Mexico, and included the entire portion of America belonging to France. Through the two following centuries and a half grave political changes took place and marvellous social changes.

In the present Province of Quebec the Roman Catholic Church has guided and controlled the habits and customs of the French race; their morals and loyalty. It helped Lord Dorchester to save the country to the English Crown in 1776; it supported Great Britain with strenuous efforts in 1812; it modified and checked the movement of 1837; and it stood by the proposals for Confederation in 1867. As a Diocese Quebec hasbecome the parent stock from which branches have been started in

the various Provinces to go through the same process of development. Halifax was erected as a Vicariate-Apostolic in 1817, with the Rt. Rev. Edmund Burke as first Vicar-Apostolic. It was made a Bishopric in 1842. Upper Canada was cut off from Quebec in 1826 with the Rt. Rev. Alexander Macdonell as first Bishop. This zealous Scotchman had some years before come out with a Colony of Catholic Highlanders, for whom he had obtained a settlement in the Eastern part of the Province of Ontario. Bishop MacDonell laid with great foresight the foundation of the Catholic Church in Ontario. Through him but not to be realized during his life, Toronto was erected into a Diocese in 1842 with the Rt. Rev. Michael Power as first Bishop.

At the time of the erection of the See of Kingston the zealous Bishop Plessis was Bishop of Quebec. He had in view the establishment of a third Vicariate in the Northwest. Several years passed before this was realized. In 1844 the Rt. Rev. Joseph Norbent Provencher, for several years Coadjutor of Quebec, was appointed Vicar-Apostolic of St. Boniface. He was succeeded by his more distinguished Coadjutor, the Rt. Rev. Alexander Antonin Taché, O. M. I., who for 43 years ministered to the limitless West with the zeal of an Apostle. The old order has changed. Missionary hardship has given way to organized duties of ministry no less trying. Churches, Schools and Presbyteries take the place of the settler's hut and hurried visit. At the present time there are in all Canada eight Archbishopries with the 23 bishoprics and one Vicariate, making in all 32 sees. It may be noted concerning Victoria, B. C., that it originally belonged not to Quebec but to the United States. A few years ago it was placed among the Canadian Dioceses.

The leaders of the Church during this long period had much to do with its success. Practical administrators, they distinguished themselves by their zeal in attending to the wants of their Dioceses. Besides the names already mentioned there were Archbishops Turgeon, Baillargeon, and Taschereau of Quebec the last being made a Cardinal in 1886; Archbishops Lynch and Walsh of Toronto, Cleary of Kingston, and Connolly and O'Brien of Halifax; Bishop Bourgst of Montreal, La Fléche of Three Rivers, and Guigues of Ottawa. Closely connected with the history of the Catholic Church is that of religious and separate school education. In most of the Provinces a system is established providing for Catholic education in the primary schools. In Quebec a complete dual system exists. From time to time questions upon education have received the importance of delegations from the Holy See and in 1899 a permanent delegation was established with Mgr. Falconia as Delegate. He was succeeded in 1902 by Mgr. Sbaretti. To carry on these various works of religion and education the principal grants in the Province of Quebec were the grants of the Island of Montreal to the Sulpitians and the estates of the Jesuits

by the King of France. Through the greater part of the country religion has been supported by the voluntary system, though the system of tithes still continues in the Province of Quebec.

The Catholic population of Quebec in 1783 has been placed at 113,000 by the Church itself. In 1830 it was at least half a million, with about 50,000 in Upper Canada; in 1851 the Church had 746,854 adherents in Lower Canada; in 1871, just after Confederation, it had 1,019,850, in 1891, 1,291,709, and in 1901, 1,429,260. In Ontario, its adherents numbered in 1851, 167,695; in 1871, 247,166; and in 1901, 390,304. In the Maritime Provinces of Nova Scotia, New Brunswick and Prince Edward Island it had increased from a total of 180,000 in 1861 to 301,072 in 1901. The Western figures are of recent date and show that in Manitoba, the Territories and British Columbia the total Catholic population in 1881 was 26,000 in round numbers, in 1891, 53,000 and in 1901, 99,384. The total number of Roman Catholics in the Dominion was 2,229,600 in 1901.

TRADE AND COMMERCE.

Historically, Canadian trade began with fishing and fur hunting, the providing of food for supplies to Hudson's Bay ports and military garrisons. Up to 1846 the trade of the British Provinces was mainly with the mother country and the West Indies. It included the export of furs, fish, grain, provisions, potash, staves and various forms of lumber and the import of liquor, tea, tobacco and molasses, with considerable quantities of manufactured goods. Then came various vital changes in transportation, tariffs and territorial growth. A large trade grew up with the United States between 1847 and 1867, declined afterwards and again increased in the form of exports to that country during recent years. In 1868, the first year after the Confederation of the Provinces, Canadian exports totalled $57,567,888 and imports $73,459,644. In succeeding decades the trade developed as follows—the two chief countries being specified:

EXPORTS.

Year.	Great Britain.	United States.	Total all Countries.
1876	$40,723,477	$31,933,459	$ 80,966,435
1886	41,542,629	36,578,769	85,251,314
1896	66,690,288	44,448,410	121,013,852
1906	133,094,937	97,806,552	256,586,630

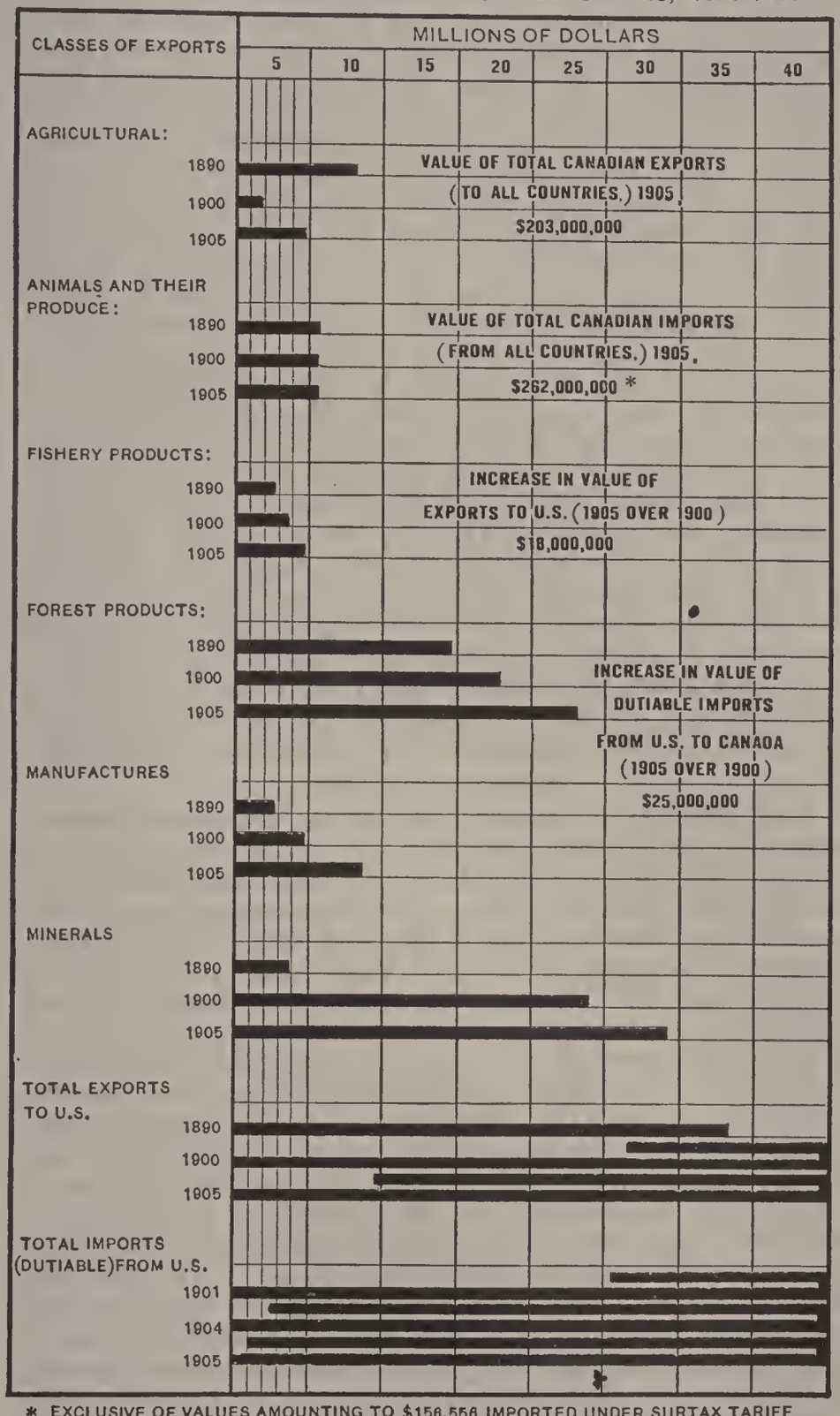
IMPORTS.

Year.	Great Britain.	United States.	Total all Countries.
1876	$40,734,260	$ 46,070,033	$ 93,210,346
1886	40,601,199	44,858,039	104,424,561
1896	32,979,742	58,574,024	118,017,508
1906	69,194,588	175,862,071	294,286,015

CANADIAN MEN OF AFFAIRS.

1. Sir William Van Horn
2. Lord Strathcona.
3. Lord Mount-Stephen.
4. Sir George Drummond.
5. Charles M. Hays.
6. George A. Cox.

CANADA - VALUES OF EXPORTS TO UNITED STATES, 1890-1905



* EXCLUSIVE OF VALUES AMOUNTING TO $156,556 IMPORTED UNDER SURTAX TARIFF

It will be seen that the great bulk of Canadian trade is with Great Britain and the United States; that the exports to each country are increasing at about the same rate; that the imports from the United States are nearly four times as much as they were 30 years before and from Great Britain not twice as much; that the imports from Great Britain are in fact at about the same total as they were in 1868 when the exact figures were $68,522,776; that the trade with other countries is advancing a little more rapidly than that with Great Britain and the United States. In the fiscal year 1904 the import of food and animals totalled $33,496,343, of which $12,596,342 were duty free; the import of articles in a crude condition but which entered into various processes of domestic industries was $49,991,587, of which $39,667,711 were free of duty; the import of articles, wholly or partially manufactured, for use as materials in the manufactures and mechanical arts was $46,854,281, of which $22,912,647 were duty free; the import of manufactured articles ready for consumption was $95,955,064, of which $18,693,049 were free of duty; the import of articles for voluntary use, luxuries, etc., totalled $17,292,744, of which $810,694 were free. The exports of that year may be classified as follows: Mine products, $33,618,944; raw forest products, $4,930,044; manufactured and partially manufactured forest products, $28,161,878; manufactures, $48,033,722; commercial and bullion, $2,465,557; fishery products, $10,759,029; animals and products of, $63,812,117; agricultural products, $37,138,875; re-export of foreign goods, $12,641,239.

TRANSPORTATION.

Railways.—The earliest method of transportation in Canada was the bark canoe of the Indian and the snowshoes of the pioneer period. Then came the small boats or batteaux used for commercial purposes, succeeded by small steamboats of which the first was built by John Molson of Montreal in 1809. This vessel ran as far as Quebec and in 1831 was followed by the *Royal William* which made a voyage to Halifax and Boston and was the first ocean steamer to cross the Atlantic. Meanwhile roads were being constructed in various directions. Bridle roads for horse-back riding were the first, with winter roads built over the snow; then came corduroy roads and finally graded roads with plank and macadam and gravel as varying constituents in the process of development. Military roads, constructed by the British authorities were, of course, the best of these early efforts. In 1779 the Coteau Rapid Canal was constructed by the Imperial authorities and in 1825 the first of Canada's present system was constructed at the Lachine Rapids on the St. Lawrence. In 1851 the deepening of the St. Lawrence was commenced and it has been continued to meet the increasing requirements of ships up to the present time. There is at present 14 feet navigation from Montreal to Lake Erie and 20 feet through the Sault Canal.

The first passenger railway built in Canada was the

Champlain and St. Lawrence. It was 16 miles long and was opened in 1836. In 1847 there were only 54 miles of railway in British America but in 1855 there were 877 miles with many more under construction. This was the first railway era in Canada and the Grand Trunk Railway followed. The Portland to Montreal section was opened in 1853, that of Richmond to Quebec in 1864, that of Montreal to Toronto in 1856, that of Toronto to Sarnia in 1859, and the original system was completed in 1860 when the Victoria Tubular Bridge was opened by the Prince of Wales—since replaced with a modern double-track bridge. Many branches were acquired and lines constructed and by 1904 its mileage was 3,144, the capital paid up and expended $356,589,034, the passengers carried for the year numbered 8,376,140 and the freight carried totalled 11,668,672 tons. The construction of the Intercolonial followed as a Government work. Running from Halifax to Quebec it was opened in 1876 and, with branch lines had on 1904, June 30, a mileage of 1,351 (including Windsor Branch, 30 miles, under lease to Dominion Atlantic Railway) with a total expenditure of $72,735,935, passengers carried (1904) numbering 2,663,156 and freight totalling 266,449 tons. The Prince Edward Island Railway, 209 miles in length, cost up to 1904, June 30, $6,128,-116 with passengers numbering in that year 224,517 and freight totalling 86,286 tons.

The second railway period commenced with the construction of the Canadian Pacific Railway. The contract for its construction was signed by Sir Charles Tupper, George Stephen, J. J. Hill, Duncan McIntyre, R. B. Angus and others 1880, Oct. 21, after years of effort and political conflict. In 1885 connection was established between Montreal and Winnipeg; 1886, June 28, the first regular train left Montreal for the Pacific Coast. An immense mileage in branch lines—new and acquired—were steadily added to the system and in 1904 there were 8,062 miles in operation, 6,224,177 passengers carried and 11,112,514 tons of freight transported. The capital expenditure had been $459,928,531 with assets including magnificent hotels at Montreal, Winnipeg, Banff, Vancouver and other places; sleeping-car services and equipment; steamship lines on the Great Lakes, upon the Pacific seacoast, and the British Columbia lakes; steamship lines upon the Pacific to Australia, China and Japan and upon the Atlantic to Great Britain.

With the beginning of the new century came the third railway era in Canadian history. The Canadian Northern Railway from humble beginnings in Ontario gradually extended its lines or acquired new ones until in 1904 the expenditure had totalled $52,785,814 and the freight carried 1,109,585 tons. During the following year this mileage and expenditure and business were greatly increased and it became well understood that the intention of the promoters, William Mackenzie and D. D. Mann, was to extend their lines further across the continent from Edmon-

ton—which they reached in 1905, November—to the Pacific Coast. Independent lines in Nova Scotia and Quebec had also been acquired. Meanwhile, the Grand Trunk Pacific project had been planned by the Dominion Government and the Grand Trunk Company, in conjunction, and surveys made and arrangements completed for a new trans-continental line running from Moncton, N. B. to Winnipeg as a Government work and from Winnipeg to Kaien Island, on the Pacific Coast, as a company-undertaking with Government guarantees.

The total miles of track laid for steam railways in all Canada (1904) were 19,611 as compared with 2,087 in 1867. The total amount of aid given by the Dominion Government in this construction was $142,944,911, up to 1904, June 30. In 1904 the train mileage of Canada totalled 61,312,002, the number of passengers 23,640,765, the tons of freight 48,997,519, the gross earnings $100,-219,486, and the working expenses $74,563,162. The number of accidents in that year was 395 killed and 1,405 injured. The passengers carried per head of the population was 4.22 in number as compared with 1.34 in 1875 and the tons of freight carried were 8.58 as against 1.46 at the earlier date.

The first electric railway constructed in Canada was a short piece of track at the Toronto Exhibition in 1883. The first practical use of electricity in street car service was by Ottawa in 1891 with Montreal following in 1892 and Quebec in 1897. In 1904, Dec. 31, there were 46 electric railways sending returns to the Government with 475 miles of single track and 201 miles of double track. The motor cars numbered 2,129, the passengers carried were 191,755,066, the capital paid-up was $30,314,730, the bonded debts were $19,641,777, the gross earnings $8,978,-378 and the gross expenses $6,528,142.

Canals.—Reference has been made to the first canal constructed in Canada. Others followed rapidly—the Rideau in 1832, the Welland in 1833, the Cornwall in 1842, the Beauharnais in 1845, the Williamsburg Series in 1847. These canals, with continued improvements from year to year and a policy of deepening the St. Lawrence to a minimum of 14 feet, helped the early transportation of products greatly. Latterly the railways have been a competitive as well as a co-operative influence. There are now five canal systems under the Dominion Government's control: (1) The through route between Montreal and the head of Lake Superior including the Lachine Canal, 8½ miles in length with 5 locks and costing $11,362,-651; the Soulanges which superseded the Beauharnais, 14 miles long with 5 locks and costing $6,851,972; the Cornwall, 11 miles, with 11 locks and costing $7,077,094; the Williamsburg Series, 12 miles, with 6 locks and costing $9,869,087; the Welland and its branches, 26¾ miles, with 31 locks and costing $25,189,908; the Sault Ste. Marie Canal, 1½ miles, with 1 lock and costing $4,313,494; (2) Route from Ottawa to Lake Champlain including the

Grenville and Carillon Canal, 6½ miles in length, with 7 locks and costing $4,182,093; the Blondeau, St. Anne's, and Perth Branch, 6¼ miles with 3 locks; the St. Anne's Canal cost $1,170,216. In this system also are the Chambly and St. Ours canals costing $758,695; (3) Route from Ottawa to Kingston including the Rideau Canal, 16¼ miles in length, with 49 locks and costing $4,084,323; (4) From Trenton on Lake Ontario to Lake Huron, at mouth of River Severn, comprising the uncompleted Trent Canal system which has so far cost $4,709,881 with 159 miles open to navigation at the end of 1906; (5) Route from Bras d'Or Lake in Cape Breton Island to the Atlantic coast comprising St. Peter's Canal and costing $648,547.

There are some smaller canals which it is not necessary to enumerate. The total cost of these improvements to the waterway system was $87,223,163 up to 1904, June 30, with additional expenditures from income of $20,012,464. The revenue since Confederation in 1867 has been only $13,327,506. The traffic for the year 1903 was 23,767 Canadian vessels, with a tonnage of 5,212,832, and 6,695 United States vessels with a tonnage of 4,236,475. The passengers carried were 236,823 in number, the freight 9,213,817 tons, the tolls $325,116.

Shipping.—The vessels built and registered in Canada were 243 in number with a tonnage of 33,192 in 1904 as compared with 490 in number and 183,000 in tonnage 30 years before. The value of those sold to other countries was $87,115 as against $2,189,270 in 1876. The sea-going vessels arriving and departing from Canadian ports in 1904, exclusive of coasting vessels, were as follows: British, 4,997 in number with a tonnage of 8,045,817; Canadian, 11,045 with 1,979,803 tons; foreign, 14,002 with 5,801,085 tons. The total vessels carrying cargo (sea-going) during the five years 1899-1903 had a tonnage of 52,000,000 as compared with 21,000,000 in 1869-73. Quebec's tonnage in this respect in 1904 was 4,097,969; Nova Scotia 3,568,196; New Brunswick 1,653,559; Prince Edward Island 142,368; British Columbia 2,545,741. Upon the inland waters between Canada and the United States the Canadian vessels arriving and departing were 19,889 in number with 7,975,487 registered tonnage as against 26,682 vessels of 4,826,780 tons in 1868; the United States vessels increased during the same period from 13,432, in number and 3,836,724 in tonnage to 21,737 with a tonnage of 7,400,013. The tonnage of vessels engaged in the coasting trade arriving at and departing from Canadian ports was 45,505,122 in 1904 as compared with 10,300,939 in 1876. Of the former total only 2,611,526 were foreign.

There are graving docks at Esquimalt in British Columbia, Kingston in Ontario, Levis in Quebec, and Halifax in Nova Scotia. Canada has 796 light-houses costing $685,723 in 1904 for maintenance; 7,157 sailing ships and steamers upon her Provincial registry books with 590,510 tonnage; an expenditure by the Marine Department of $2,150,940, in 1904.

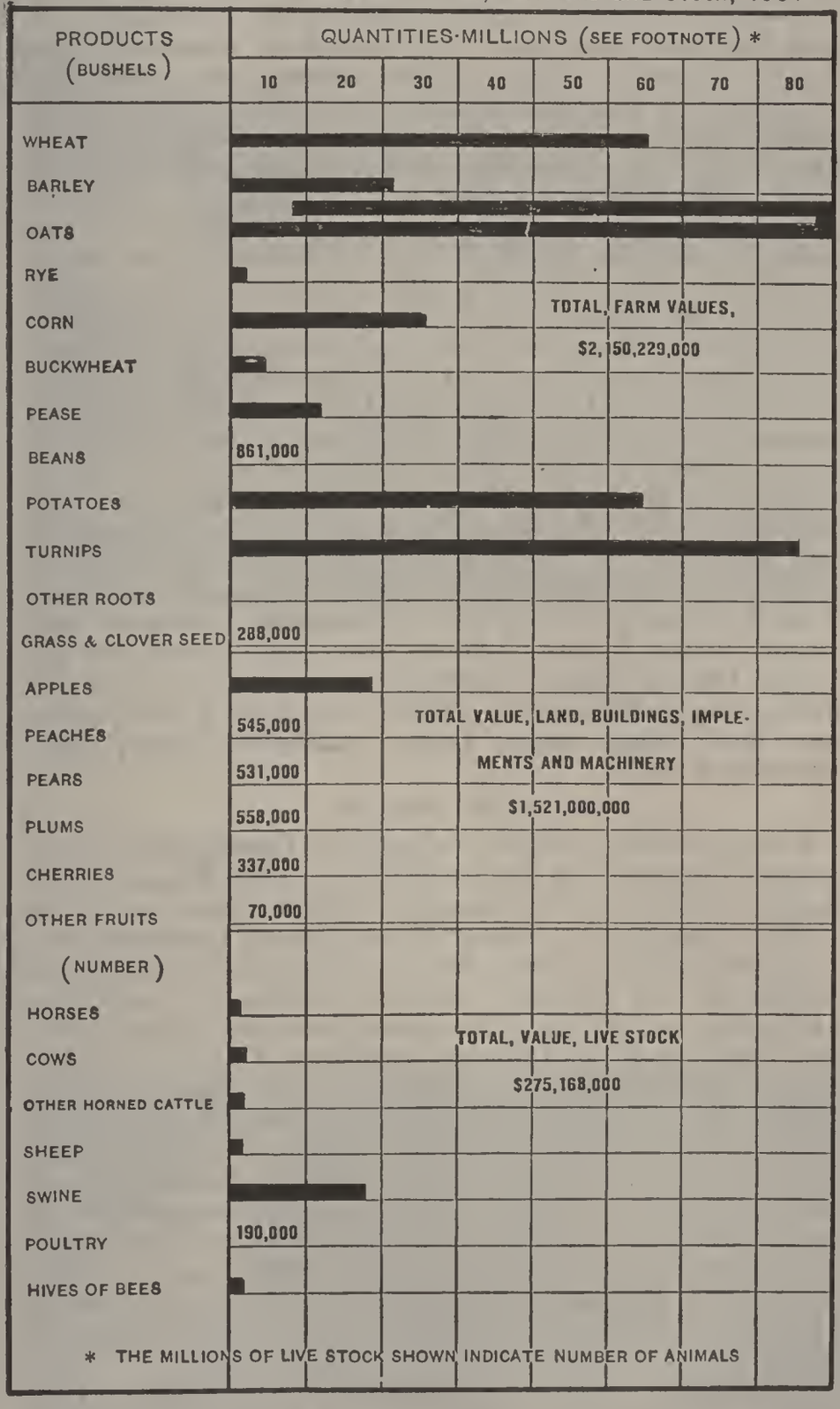
CANADA.

AGRICULTURE:

The history of agriculture in Canada is not unlike that of the United States development. It falls easily into periods—the first when French Canada or Quebec was the sole or principal producer of wheat up to a total of some 3,000,000 bushels and the settlers' work there and in Upper Canada was one of clearing the forests, building rude log huts, making potash, carrying roads through the wilderness, or hunting and trapping for the food of the family. From 1812 to about 1837 Upper Canada (Ontario) grew gradually in agricultural resources and wealth and settlement. There were no railways and transportation was primitive. During the next 30 years marked strides were made in the Upper Province and it became the agricultural centre of British America. The occupied land grew from 6,212,726 acres in 1842 to 13,354,896 in 1861; the production of wheat from 3,221,989 bushels to 24,620,425 bushels; the production of oats from 4,788,167 to 21,220,874 bushels; the horses, cattle, sheep and swine doubled in number. Immigrants also poured into the country. In the next 20 years this development went on apace, and in 1883 the farm lands of Ontario were valued at $654,793,025, with implements worth $43,522,530 and an area in field crops of 7,542,623 acres. The total value of farm property in Ontario in 1883 (lands, buildings, implements and live stock) was $961,428,595. Then came the opening of the Northwest, the immigration of young Canadians thither and to the greater centres of population in the States. A decrease in farm land values of $100,000,000 took place in the years between 1883 and 1897. Then began the upward movement and in 1905 the Ontario agricultural values were as follows: Land, $649,-201,364; buildings, $264,384,514; implements, $68,629,546; live stock, $172,483,760; total, $1,154,699,184.

Meanwhile the West had been evolving into what its enthusiastic votaries call 'the bread-basket of the world.' Manitoba gradually grew into a productive Province and then, more suddenly, into full recognition of the marvellous qualities of its soil. The Northwest Territories have only recently (1906) become productive, but their resources are now well known, although variously estimated. Dr. William Saunders, Director of the Canadian Experimental Farms, estimates that 171,000,000 acres of land in Manitoba, Saskatchewan and Alberta are suitable for crop production, of which 42,750,000 acres may annually be sown to wheat, giving a possible production of 800,000,000 bushels. Of this three-fourths should be available for export as wheat or flour. Professor Mavor, in a British Board of Trade Report (1904) quotes an 'authoritative' estimate of 92,000,000 acres of settlement area and 13,-750,000 acres annually available for wheat production with an exportation of 169,000,000 bushels. Mr. Hugh McKellar, when Deputy Minister of Agriculture in Manitoba, estimated in 1902 the total wheat production of Manitoba and the (present) Provinces of Saskatchewan and Alberta

CANADA - AGRICULTURE. FIELD CROPS, FRUIT AND LIVE STOCK; 1901



by 1912 at 350,000,000 bushels, and then only 20,000,000 acres out of what he considered an available area of 75,000,000 acres would be cultivated. The actual production of Manitoba in 1905 was 55,761,417 bushels of wheat and 45,484,025 bushels of oats. That of the Territories (or new Provinces) was 28,413,810 bushels of wheat and 28,727,235 bushels of oats. These figures are rapidly increasing and the total estimate for 1906 is 100,000,000 bushels of wheat alone. The total agricultural exports of Canada in 1904 were $85,606,483, of which $78,174,052 went to Great Britain as compared with an export of $19,341,387 in 1868; $30,802,010 in 1878; $38,187,456 in 1888; and $75,834,858 in 1898. According to the census of 1901 the value of farm property in Canada was $1,787,102,630; the value of field crops, fruits and vegetables, $208,000,000; the value of dairy products $66,000,000; and the value of live stock sold or slaughtered, $75,700,000. The occupied land was 63,422,338 acres, of which Ontario possessed 21,000,000 acres and Quebec followed with 14,000,000 acres.

The chief crops in order of importance were as follows: Ontario,—hay, oats, wheat, peas, barley, corn, potatoes, and roots; Quebec,—hay, oats, wheat, barley, tobacco and potatoes; Nova Scotia,—hay, oats, wheat and potatoes; New Brunswick,—hay, oats, buckwheat, potatoes and wheat; Prince Edward Island,—hay, oats, wheat and potatoes; the Territories,—wheat, oats, barley, potatoes and forage crops; Manitoba,—wheat, oats, barley, flax, potatoes and forage crops; British Columbia,—hay, oats, wheat and roots.

HORTICULTURE.

Fruit growing is a great industry in Canada and is constantly increasing in its proportions. The Niagara Peninsula in Ontario, the Okanagan, Similkameen and other valleys amongst the mountains of British Columbia, the Annapolis Valley in Nova Scotia, are especially well-known regions in this respect. The varied climatic conditions of Canada include many elements favorable to fruit farming. In the East, the cool sheltered valleys of Nova Scotia afford conditions congenial to the growth of the apple to a wonderful degree of perfection and of the highest flavor. In Prince Edward Island and in portions of New Brunswick there are many successful orchards and fruit growing in these provinces is rapidly extending. In the western parts of Quebec, particularly about the Island of Montreal, much highly flavored fruit is grown, while throughout the greater part of Ontario most progressive farmers have an apple orchard as one of their sources of income.

In Western Ontario, particularly in the Niagara Peninsula, also along the shores of Lake Erie, the climate is specially favorable for the growth of the more tender fruits in great perfection, and in these districts the choicest varieties of peaches, pears and plums are grown in large

1. Buffaloes, Silver Heights, Winnipeg.
2. Irrigation, Alberta, Canada.

quantities. In these specially favored spots the growing of fruit is the chief occupation of a large number of the inhabitants. A wide area in these districts is also devoted to the cultivation of small fruits, specially strawberries and raspberries, grown to meet the demand in the large centres of population. The acreage under grapes is also large, and wine making is an important industry in the counties of Lincoln and Essex.

On the great plains in the central-western country the larger fruits are not grown successfully owing to unfavorable conditions of climate. Some of the small fruits, however, are produced in considerable quantities. In the central valleys of British Columbia, lying between the two ranges of mountains known as the Gold and Coast Ranges, where the rainfall is scanty, fruit growing is carried on extensively, and where sufficient supplies of water are available for irrigation, apples, pears, plums and cherries are very successfully cultivated, and in some districts the peach also. West of the Coast Range, in what is known as the coast climate, the conditions are not very favorable for the peach; but the other large fruits mentioned are grown in great perfection and in abundance.

The actual number of fruit trees in the country, according to the census of 1901, was 14,087,936 in Ontario, 3,055,805 in Quebec, 2,294,780 in Nova Scotia, 761,834 in New Brunswick, 360,060 in Prince Edward Island, 567,782 in British Columbia, 63,637 in Manitoba, and 9,405 in the Territories. The number has greatly increased since then and the figures give little real indication of the possibilities of Canada as a fruit-bearing country. An extensive study of the fruit statistics of Canada was presented to the Second Conference of Fruit Growers held at Ottawa in 1906. The annual value of the fruit crops of Canada for the past five years was therein estimated at $10,295,625. The apple exports vary from year to year. In 1904 they were valued at $4,590,793.

FORESTS AND LUMBER.

The forest area of the Dominion is very large. Mr. George Johnson, when Dominion Statistician, estimated it at a total figure of 1,248,798 square miles, of which Ontario possessed 102,118; Quebec, 116,521; New Brunswick, 14,766; Nova Scotia, 6,464; Prince Edward Island, 797; Manitoba, 25,626; British Columbia, 285,554 and the two new Provinces and the Territories 686,952 square miles. According to these figures the comparison with other countries is very striking, Canada having 148.8 acres of forest and woodland per head of the population (1901), while Norway comes next with a little over nine acres, Sweden with about the same, the United States with seven acres and European Russia with nearly four acres. The sub-arctic forests of Canada are noted for their vast quantities of spruce timber. While some of this is large enough to be sawed into lumber the greater part is too small for that purpose but well adapted for the manufacture of pulp. It would be safe to say that many bil-

lions of cords of pulp-wood exist in these forests. The industry arising out of these vast resources in timber has always been an important one in Canada, from the early days when it rivalled the fur trade in public attention to the second year following the Confederation of the Provinces when (in 1869) the produce of the Canadian forest exported was valued at $20,423,882 out of a total export of $60,474,781. In 1904 it was $33,091,922.

In Ontario there is some pine to be found and quantities of spruce, birch, poplar and tamarac. The forests of the Georgian Bay region still have plenty of pine but these are being steadily depleted while the districts of Nipissing and Algoma are well timbered with pine, birch, cedar, maple, spruce, poplar and tamarac. Temiscaminge pine lands and the Ottawa valley forests and lumbering regions are well known. In the northern part of Ontario official estimates place the unsold red and white pine at 6,000,000, feet, board measure, worth $42,000,000, while in 1904 a member of the Ontario Government placed the timber assets of the Province at $200,000,000. Other trees found are basswood, cherry, white, red, black, and green ash, elm, bitterwood, oak, chestnut, beech, butternut and hemlock.

Quebec at one time boasted vast pine forests and they are still valuable though fires and lumbermen are slowly working their destruction. Spruce abounds throughout the Province, as do hemlock, maple, birch, cherry, ash, elm, oak, beech, poplar, cedar and tamarac. Mr. J. C. Langelier, an authority upon forest conditions in Quebec, has estimated the possible production as follows: saw-logs from soft woods 155,425,000,000 feet, board measure; saw-logs from hardwoods 21,650,000,000 feet, board measure; pulp-wood 745,493,000 cords; railway ties, 730,000,000 pieces; poles for electric wires (cedar) 17,500,000 pieces; shingle blocks 700,000,000 feet, board measure; square timber 30,000,000 cubic feet. He estimated the total value at present prices as $451,000,000.

The Labrador country is supposed to be well filled with forests of spruce, birch and tamarac. In New Brunswick pine has almost disappeared and spruce is now the staple of the lumber trade. Cedar is abundant and young growths of red pine, poplar and spruce are coming up in the Miramichi district. Nova Scotia has spruce and tamarac in abundance and Prince Edward Island still possesses some good hardwood. All these Provinces have varieties of the maple, ash, elm, hemlock, birch, oak, poplar and tamarac. In the new Provinces and the Territories the forest and woodland region is very sparsely timbered except along the banks of rivers in the far northern basin of the Mackenzie and its tributaries where lies the great forest belt of Canada with its immense resources of poplar, banksian pine and a superior sort of spruce. Manitoba has some spruce and poplar and British Columbia has immense forests of Douglas fir in which trees grow to enormous sizes.

Next in commercial importance is the cedar and there is an abundance of spruce, hemlock, tamarac, and poplar with some excellent hardwood—oak, maple, etc. The percentage of woodland in the farms of Ontario is 22 per cent., Quebec 38 per cent., New Brunswick, 57 per cent., Nova Scotia 56 per cent. and Prince Edward Island 30 per-cent. This large proportion is due, however, to the plentiful forests of newer and only partially-settled regions. On the farms of the older settlements 5 per cent. would be a good estimate.

According to the census of 1901 the value of the forest production of Canada in that year was $51,082,689, including British Columbia $2,634,157, New Brunswick, $2,998,038, Nova Scotia, $3,409,528, Ontario, $21,351,898 and Quebec $18,969,716. In 1904 the exports of forest products totalled $33,091,922 with $3,633,223 of manufactured articles. There are various important interests dependent upon the forest product of Canada and the census of 1901 showed $89,959,336 to be invested in industries connected with timber and wood. The amount paid out in wages was $23,472,458 and value of the product was $80,341,204.

The preservation of the forests is an important question in Canada. Fires have done enormous damage in the past; they are still very prevalent in the present. Forest reserves are being set aside by the Dominion authorities and by the older Provinces; throughout the west the Provincial Governments and the settlers are co-operating in the planting of trees; and the Canadian Forestry Association is doing good work.

FISHERIES.

A country bounded by two oceans, possessed of 12,780 miles of sea-coast, including within its territories or upon its inland borders the greatest bodies of fresh water in the world, must necessarily have immense fishing interests. According to official statistics the total product of Canadian fisheries from 1868 to 1904 was $600,000,000. In 1904 the production by Provinces was as follows: Nova Scotia, $7,287,039; New Brunswick, $4,671,084; Prince Edward Island, $1,077,546; Quebec, $1,751,397; Ontario, $1,793,229; British Columbia, $5,219,107; Manitoba and the Territories, $1,716,977.

Much might be said as to the nature of the varied and widely-distributed fishing grounds of Canada on lake and river and ocean. The deep fisheries are probably the most important, although much of the 12,000 miles of sea-coast has not yet been adequately worked. The coast of Nova Scotia from the Bay of Fundy, around the western part to Canso (a long established fishing centre), along the coasts of Cape Breton, New Brunswick and Prince Edward Island—including the Baie des Chaleur and the Gaspé shores—and extending to the Island of Anticosti and the prolific Labrador waters, not omitting the Magdalen Islands in the centre of the Gulf of St. Lawrence, are the chief Atlantic points. First rank must be given to the

cod-fishery, owing to its value and extent. The abundance of cod is incredible, but the catch is subject to fluctuations, the take in 1904 being $3,643,654. The schools appear between the middle of May and the beginning of June, and the fishing is carried on in vessels of 60 to 100 tons on the 'banks' or in open boats near shore.

The herring fishery is next in importance, but is capable of great development, if superior methods of curing were generally adopted, the returns in 1904 being $2,135,000. Vast quantities of immature herring are sold by Bay of Fundy fishermen to the canneries in Eastport, Maine, and other centres to be packed as sardines, but herring are plentiful all along the Maritime provinces, while off northern New Brunswick, Quebec, and the Magdalen Islands, they are very abundant, though the industry is largely undeveloped. The mackerel fishery was formerly of great importance, the combined overfishing of the United States and Canadian fleets resulting, however, in a serious decline nearly 20 years ago, and in 1903 the value was only $1,644,-319, whereas so long ago as 1871 it was $2,406,426.

A very different industry is the lobster fishery. It has witnessed a marvellous growth, and Canada may now be said to supply the markets of the world, nearly 800 canneries packing canned lobsters, valued in 1904 at $2,690,572, which, with $1,000,579 added for lobsters sold alive, brings the total value up to $3,691,151. Owing to the decline of certain fisheries, the lobster industry has been of vital importance to many parts of the coast and to Prince Edward Island specially so.

It may be added that the oyster fisheries of this part of Canada are very rich, though they do not as yet yield more than $200,000 a year. The Atlantic seal fisheries of the Labrador coasts and the Magdalen Islands are also rich in themselves and are largely developed by Newfoundland fishermen. Canadians take little part in the work—perhaps because of the hardships involved—although the business is said to pay 25 and sometimes 40 per cent. upon investment. Other fish found plentifully in these Atlantic waters are haddock, halibut, hake, and white whale. In the estuarine fisheries of the Maritime Provinces are salmon, shad, gaspereaux (alewife) striped bass, smelts and in the lakes winninish, or landlocked salmon, lake trout, maskinonge, etc.

On the Pacific coast the salmon fishery is the chief one and questions connected with the use of traps and the competition or methods of American fishermen are matters of continuous controversy. The various species of salmon include the sockeye, the quinnat, the dog-salmon, etc., and the production varies but little. It was $3,328,586 in 1900 and $3,352,782 in 1904. Other fish in these waters are halibut, black cod, the oolachan, anchovy, herring, sardine, smelt and many others which are not utilized to any extent.

The Canadian waters of the Pacific coast are unique, not only because of their remarkably prolific character,

out, owing to the fact that they are sheltered from the storms of the open ocean by Vancouver Island and the Queen Charlotte Islands, deep sea fishing can be carried on under most favorable circumstances. Halibut fisheries are assuming importance, but these, and the black cod, oolachan, herring, sardine, smelt, and other valuable kinds, have not been hitherto utilized to any adequate extent. The salmon industry has been pre-eminent, and capacious well-equipped canneries occur at numerous points along the coast, especially in the estuaries of the Fraser, Skeena, and Rivers Inlet. The various species of salmon include the sockeye, quinnat, dog-salmon, etc., the first named being of chief commercial importance, and yielding in 1904 $2,236,291, out of the total value $3,352,782 recorded for the British Columbia salmon fisheries. Questions connected with the use of salmon traps, and conflicting regulations in contiguous international waters have been matters of continual controversy, in which large commercial interests are involved in British Columbia and the State of Washington. The fur-seal fisheries have attracted wide attention owing to their prominence as matters of international arbitration; but their value to British Columbia was in 1903 only $311,902, and in 1904 $224,190. Whales being abundant on the Pacific coast the recently inaugurated whale-factories on Vancouver Island have a promising future. Extensive oyster beds exist and with the introduction of the Atlantic species, which is much larger than the Pacific oyster, the fishery will rapidly develop.

The fisheries of Hudson's Bay, whose drainage area is no less than 2,700,000 square miles, have never yet been exploited, though enormously valuable whale, seal, and walrus industries have been carried on for a long period. The waters of the Mackenzie River belong to the same category, while in most of the rivers, flowing through the great Northland of Canada, the sturgeon, inconnu, pike, large Arctic trout, and other fishes occur. Beluga or white whales and hair seals are generally distributed in these Arctic and sub-Arctic seas. A remarkable feature of the Canadian coast fisheries, to which allusion has been already made, is the vast extent of waters partially enclosed by land, where deep-sea fishing is pursued on a large scale, the area of the Gulf of St. Lawrence being 80,000 sq. m., Hecate Straits nearly 12,000, and the Straits of Georgia and Fuca over 10,000 sq. miles; while Hudson's Bay is about half the area of the Mediterranean Sea. In various ways the Dominion Government is giving encouragement to the fisheries. To meet the frequent danger of shortage of bait State-aided freezers have been erected at about 40 points along the Atlantic coast, providing the fishermen with cold storage for herring, squid, etc., during the months of plenty, and rendering it available in a frozen state during the months of scarcity. 50 per cent. of the cost of each freezer is paid by the Government, and a bonus of $5.00 per ton on the amount of bait placed in

each freezer is guaranteed for three years. Large freezers to meet the needs of the fleet of 'bankers' are being operated at Halifax, Canso, and other centres, each costing $50,000 and upwards. The erection of patent fish-dryers forms also part of the recent scheme of the Government and the initial establishment at Souris, Prince Edward Island, has already shown most satisfactory results. The drying process is independent of weather changes and the standard of the dried product is raised. For three years a Scottish herring-curing experiment has been in progress; and the Canadian herrings packed have been pronounced superior to any hitherto put up in the Dominion. The utilization of fish-waste, especially the abundant and detested sea dog-fish is also being urged on by the Government, and capacious reduction works are being operated at Canso, N. S., Shippegan, N. B., and other localities. Oil, etc., is being produced in addition to valuable fish-guano, and a sum of about $200,000 is being expended in starting the scheme. The dog-fish, which have been in recent years a serious menace to the prosperity of the fisheries on the Atlantic, and only less so on the Pacific, are being experimented with in order to prove its qualities as a prepared food. Canned dog-fish has been pronounced very palatable. If the eel-fishery, not many years ago a neglected enterprise, has risen to a value of nearly $130,000 (1904), and the smelt which was formerly used merely for fertilizing the land, now has an annual value of about $500,000, while the clam fisheries have increased in ten years from $29,727 (1895) to $269,851 in value in 1905, there is reason to expect that other fishing industries (such as the herring) will expand in the immediate future. Recently the Federal Government has apportioned $25,000 for the purpose of encouraging the shipping of fresh fish to the Upper Province markets.

Turning to the more important of the fresh water fisheries of Canada we find the great lakes—Ontario, Erie, Huron and Superior—teeming with fish of every kind suitable for the table. So with the immense number of rivers running into these vast bodies of water and the St. Lawrence River. Similar conditions exist in the Lake-of-the-Woods district with its many rivers; in the marvellous chain of lakes and rivers comprised in the Mackenzie system; in the British Columbia series of lakes and rivers covering an area of plain, valley and mountain stretching 1,000 miles north and south and 500 miles east and west; in the Manitoba chain of lakes and rivers where whitefish, pickerel, sturgeon and pike are largely exploited. Food fishes of the most delicate flavor are simply innumerable. The whitefish, the salmon trout, the sturgeon, the pickerel, the pike, the black bass, the perch, the carp abound in Ontario waters and most of them are also found in those of Manitoba and the Northwest in much the same measure.

The total production of Canadian fisheries in 1870 was $6,577,391; in 1904 it was $23,516,439. The capital in-

vested in the industry was placed at $16,048,093 in 1902 and the persons engaged in it at 80,000. Bounties of about $160,000 are paid annually to the fishermen. Government hatcheries, scientific biological stations, etc., are provided by the Dominion authorities together with a Fisheries Protection Fleet of a dozen vessels upon the sea-coast and great lakes.

MANUFACTURES.

The geographic and economic conditions of Canada favor a wide and varied industrial development. The country possesses an abundance of raw material, including the product of farms, mines and forests; easy and plentiful means of transportation exist or are being rapidly extended and created; water power of every description and the widest conceivable distribution is available; the rapid increase in population provides an ever expanding market for manufactured goods.

The capital now invested in manufacturing is at least $530,000,000. According to the 1901 census there was in that year $446,916,487 invested in 14,650 establishments which employed five hands or over. The employes numbered 344,035, the wages were $113,249,350 and the value of the product was $481,053,375. The chief branches of industry in 1901 and the value of product were respectively as follows: sawmills, $50,805,084; wooden boxes, $1,927,720; pulp mills, $4,246,781; paper mills, $4,380,776; printing and publishing, $10,319,241; flour, $31,835,873; bread, biscuits and confectionery, $11,637,808; sugar, $12,595,000; brewing and malting, $6,475,400; tobacco, $11,802,112; slaughtering and meat packing, $22,217,984; tanneries, $12,068,600; harness and saddlery, $3,427,255; boots and shoes, $18,481,216; furniture, $6,949,384; carriages and wagons, $6,650,912; rolling stock, $11,500,816; agricultural implements, $9,597,389; boilers and engines, $4,626,214; foundries and machine shops, $15,292,445; iron and steel products, $6,912,457; smelters, $7,082,384; wire works, $2,030,465; plumbers supplies and tinsmiths, $7,375,541; electric appliances, $3,032,252; electric works, $2,008,017; gas works, $2,327,466; oil refineries, $3,519,493; paints and varnishes, $2,786,593; brick and tile and pottery, $3,299,917; shipyards, $1,899,836; cotton goods, $12,033,052; woolen goods, $7,359,541; hosiery and knitted goods, $3,857,519; hats, caps and furs, $5,876,467; clothing (men's), $17,755,730; clothing (women's), $6,559,207; men's furnishings, $4,623,652; cordage, $2,212,663; soap, $2,143,945; rubber goods, $1,574,422; musical instruments, $3,023,730.

The history of Canadian industries dates from the primitive milling and tanning of pioneer days, follows down through a prosperous period of wooden ship-building in Quebec and Nova Scotia and of lumbering and agricultural development in Ontario and Quebec; and with the early seventies enters upon an era of steady and widespread expansion. The adoption of a national protective policy in 1879 proved a wonderful stimulus to the growth

of Canadian industries and it is to the continuance of this policy that Canada owes in a large measure the prosperity she enjoys to-day. The figures for 1901 have been given and those for three preceding decades will further illustrate the progress made along these lines. In 1871 the number of establishments was 43,756, the capital invested $77,964,020, the wages paid $40,851,009 the number of men employed 187,942, and the total value of the products $221,617,773. In 1881 the number of establishments was 49,722, the capital invested $165,302,623, the wages paid $59,429,002, the number of hands employed 254,935, the value of the products $309,676,068. In 1891 the number of establishments was 75,968, the capital invested $354,-620, 750, the wages paid $100,663,650, the number of hands employed 370,256, the total value of products $476,258,-886. The method of taking the Census in 1901 was changed and only industries employing five hands or over were included. Hence the apparent decline in that year. Had the figures for 1891 been compiled upon this new basis the number of establishments would have been 14,065, the capital invested $296,350,316, the wages paid $79,234,311, the number of hands employed 272,033, and the value of products $368,696,723, with a large consequent increase in 1901.

WATER POWERS AND ELECTRICAL DEVELOPMENT.

Canada has enormous water power capable of development for industrial and other purposes. Niagara Falls, in this respect, is an asset of incalculable value to Ontario although shared, in part, with the United States. It is authoritatively estimated that the contents of 6,000 cubic miles of water with a reservoir area of 90,000 square miles, and draining 300,000 square miles of territory, are there discharged through two narrowing precipitous channels only 3,800 feet wide and 160 feet high. The quantity of water passing over the Falls is estimated at 1,000,000 tons per hour—equal to about 275,000 cubic feet per second. Between Lake Erie and Lake Ontario there is a total difference of level of 320 feet and the amount of power represented by the fall of water is calculated at varying figures from the 6,000,000 horse-power estimate by the Ontario Power Commission up to the 16,800,000 horse-power estimate of Sir William Siemens in 1877. The Companies developing this power on the Canadian side are the Electrical Development Company of Ontario, 125,000 horse-power, the Canadian Niagara Falls Power Company, 100,000 horse-power, the Ontario Power Company, 250,000 horse-power. Those on the United States side include the American Niagara Falls Power Company and the Niagara Falls Hydraulic Company with about 300,000 horse-power between them.

In 1906 the Ontario Power Commission and the Hydro-Electric Power Commission appointed by the Provincial Government made public elaborate reports upon the cost and transmission of power from the Falls. It was

estimated by the first-named body that the direct value of the water-power obtainable from the flow of Lake Erie into Lake Ontario was $2,000,000,000; that under adequate development the saving in cost to the people of Ontario for lighting, heating, manufacturing, transportation, etc., over the use of steam, would be $120,000,000 a year, at least, and probably $250,000,000. In actual use such power would represent more than all the steam engines and boilers in the United Kingdom—estimated at 5,000,000 horse power. In addition to this great water-power there are in Ontario those of the Trent Valley district and the Lake Huron and Georgian Bay region where the various rivers provide a large undeveloped force of at least 1,000,000 horse-power for pulp-grinding, wood manufacture or transportation purposes.

The Winnipeg River, in the West and the St. Lawrence River above and below Montreal; the Chaudiere and other Falls on the Ottawa and tributary rivers where there is available some 900,000 horse-power; the Montmorenci Falls below Quebec which leap into the St. Lawrence a distance of 250 feet; are all being developed along electrical power lines with immense resources still untouched. Grand Falls in the St. John River, N.B., Peribonka Falls in Quebec, Saskatchewan River Rapids in the West, Metabetchouan Falls, Ouiatchouan Falls and St. Ann's Falls in Quebec, Kakabeka Falls in Ontario, Kamanaskis Falls in Alberta and Bonnington Falls in British Columbia, are a few other notable Falls.

Lake St. John, in Quebec, is fed by many rivers providing, within 20 miles, 150,000 horse-power with at least 700,000 horse-power in the entire region of which that lake is the reservoir. In the great chain of lakes and rivers running north and west to the Arctic ocean and in the innumerable rivers of British Columbia there is untold, illimitable water-power of every kind and degree of industrial or general value. Resulting from the explorations of these resources there has been a large and rapid development of electrical power for various purposes and much public discussion as to Government control of its application. Besides the harnessing of Niagara, in which the Electrical Development Company of Ontario has been a pioneer and prominent factor, with arrangements now in force for supplying the City of Toronto with 6,000 horse-power, the Montreal Light, Heat and Power Company supply that city and vicinity with electrical power, the Shawinigan Water and Power Company have largely developed and applied the power from the Falls of that name to manufacturing purposes and the British Columbia Electrical Railway Company uses electricity obtained by conveying water from Lake Coquitlam, near Vancouver, through a tunnel into another lake. Similar enterprises are under way in Winnipeg and various other Canadian centres.

CANADA.

FINANCE AND CURRENCY.

The early financial record of the British Provinces was one of dependence upon the Imperial Government for funds to pay officials, effect transportation improvements, meet military expenses, compensate Indian tribes, and indemnify United Empire Loyalists, etc. Then came a period up to 1841 when Great Britain bore an increasingly small portion of financial responsibility in all save military expenditure. After that date conditions varied in the United Provinces of Upper and Lower Canada (Ontario and Quebec) and in the Atlantic Provinces, but at Confederation in 1867 all expenses were taken over from the mother-country, excepting military defense, upon which up to the end of the 19th century she had spent in Canada some $300,000,000. The new century saw the final assumption of the fortifications of Halifax and Esquimalt and British relief in this respect.

At Confederation the debts of all the Provinces were assumed and allowances granted to them upon terms which have since been changed upon several occasions. New Provincial debts have also been incurred. The gross debt of Canada in 1868 was $96,896,666, and in 1904 $364,962,512. Subsidies to the building of railways and canals was the chief element in this increase. The assets of Canada placed against these totals in 1868 were $21,139,531 and in 1904 $104,094,794. The customs taxation of 1868 was $8,578,380 and the excise $3,002,588. In 1904 they were, respectively, $40,702,611 and $12,958,708. The accounts of the Dominion are kept in the form of consolidated revenue and capital account.

The payments on capital account are chiefly for railways and canals with special sums for militia and similar services. Between 1867 and 1904 there was spent in this way $4,702,081 upon the militia, $66,694,740 upon canals, $62,785,372 upon the Canadian Pacific Railway, $31,010,419 as extra debt allowances to Provinces, $6,158,984 upon Dominion lands, $62,729,541 upon the Intercolonial and connected railways, with other sums upon special public works and the Northwest Territories. The revenue per head of the population was $4.05 in 1868 and $12.61 in 1904; the expenditure $4.00 and $9.92 respectively. The Provincial revenues with Dominion subsidies and total expenditures were as follows in 1903-4:

Province.	Dominion Subsidy.	Total Revenue.	Expenditure.
Ontario	$1,339,287	$6,128,358	$5,267,453
Quebec	1,086,713	4,880,687	4,795,469
Nova Scotia	432,806	1,194,736	1,161,456
New Brunswick	491,361	890,653	885,457
Manitoba	553,116	1,486,667	1,271,733
British Columbia	307,077	2,638,260	2,862,794
Prince Edward Island	211,932	307,730	356,120

In 1905 the Northwest Territories became, in part, the

new Provinces of Saskatchewan and Alberta with yearly allowances from the Federal authorities of $1,030,375 each. In 1906 the subsidy system was remodelled with larger allowances to each Province and special consideration to British Columbia in view of its small population. The Provincial gross debts in 1904 totalled $35,880,247 in Quebec; $7,364,623 in Nova Scotia; $4,066,161 in New Brunswick; $20,684,727 in Manitoba; $13,534,440 in British Columbia; and $730,223 in Prince Edward Island. Against these sums were various assets reducing the net total very considerably.

A natural part of Government finance is the currency and coinage of the country. Until the British Régime there were various French coins, Spanish dollars, Colonial coinage struck in France, European coins of all kinds, private paper of varying degrees of value and worthlessness. In 1777 the Halifax (British) currency and the Spanish dollar were made legal tender. With variations and attempts at change this system remained until 1853 when the United States decimal system was introduced and in 1858 made the official currency. In 1868, in 1871, and in 1886 Federal legislation was passed consolidating and confirming this condition with $4.86 $\frac{2}{3}$ as the legal value of the British sovereign. In 1866 the Canadian Provincial Government sanctioned an issue of notes not to exceed $8,000,000 and this, with a small Nova Scotian issue, was assumed at Confederation. Various Acts were passed regarding paper issues—in 1868, 1870, 1872, 1875, 1880 and 1903. Finally the Government obtained the right to issue Dominion notes up to a total of $30,000,000 over and above the Provincial notes still outstanding and redeemable in specie when presented. Most of this issue, amounting in 1904, April 30, to $39,692,637, is held by the banks. The silver coinage of Canada is legal tender up to $10 and the bronze coinage up to $1. The British sovereign and gold coinage, the American gold eagle and its multiples or halves and the Dominion notes, are all full legal tender.

BANKS AND BANKING.

The history of banking in Canada is marked by many changes and by a process of evolution in accordance with the conditions of the country and habits of the people. The Scotch system has been largely followed with United States additions and some English customs. The Bank of Montreal was the first to be established in 1817, with a charter granted in 1833 and a capital of $350,000. To-day it has a capital and reserve of $18,000,000 and assets 1905, Dec. 31, of $153,000,000. Many banks were organized in the next 10 years and in 1837 a financial fever occurred in Upper Canada with nine charters asked for. In this year the total note circulation of Canadian banks was $2,558,-204, the specie held was $601,332, the deposits were $1,378,-528, the loans and discounts were $7,019,876 and the capital $4,118,776. In Nova Scotia the Halifax Banking Company started in 1825; in New Brunswick the Bank of

New Brunswick was chartered in 1820; in Manitoba the Merchants Bank opened a branch in 1873.

In the Banking Act of 1871 (the first general Banking Act passed by the Federal Parliament) it was provided that banks should not issue notes of a less denomination than $4, and that they should hold, as far as practicable, one-half their cash reserves in Dominion notes and never less than one-third. Business could not be engaged in until $500,000 of stock had been subscribed, and $100,000 paid up in cash, and a certificate to that effect procured from the Government Treasury Board. The amount of notes in circulation was not to exceed the amount of the unimpaired capital. No dividend was to be made that impaired paid-up capital, and no division of profits greater than 8 per cent. per annum could be paid, unless after paying the same, the bank had a reserve fund equal to one-fifth of its paid-up capital. In the Act of 1881 it was provided that banks should not issue notes of less than $5, and that all notes less than $5 then outstanding should be called in and cancelled as soon as practicable. It was also provided that the notes of the banks should be a first lien upon the assets. The minimum of reserve to be held in Dominion notes was 40 per cent. The unauthorized use of the title of 'Bank,' 'Banking Company,' etc., without the addition of 'not incorporated' was made a misdemeanor. The exchange of warehouse receipts for bills of lading and *vice versa* was permitted in order to facilitate the marketing of the goods. The revision of 1890 resulted in changes in the law intended to operate to the advantage of the public in two directions: (a) by securing to noteholders at all times and in all parts of the Dominion the face value of all notes of all banks of Canada whether solvent or insolvent and (b) by securing solidity in banking institutions by compelling those seeking bank charters to have a capital of at least $250,000 paid up and deposited with the Government. The statistics of Canadian Banks on 1868, Dec. 31, and on the same date in 1905, were as follows:

	1868	1905
Paid up capital	$30,607,447	$ 85,294,210
Notes in circulation	9,350,646	69,981,574
Total on deposit	33,653,594	556,291,305
Total discounts	52,299,050	599,953,273
Total liabilities	45,144,854	662,160,127
Total assets	79,860,976	815,533,302

One of the striking features of this expansion has been the maintenance and extension of the branch bank system. On 1905, Jan. 1, some 34 banks had 1,145 branches and during that year 168 more were added to the total. Bank clearing houses were established in 1887 at Halifax, in 1889 at Montreal, in 1891 at Toronto and Hamilton, in 1893 at Winnipeg, in 1896 at St. John, in 1898 at Vancouver and Victoria; in 1901 at Ottawa. In 1904 the total clearances were $2,735,744,235, with Montreal totalling $1,065,067,000 and Toronto $842,097,066.

Post-Office (Government) savings banks have existed in

Canada since 1867 and the deposits in these institutions and the special Government savings banks totalled $60,-771,129 in the years 1903-4. During that year the loan companies of Canada showed a paid-up capital of $51,033,-233 as compared with $13,858,634 in 1877; deposits of $71,102,186 as against $19,958,641; current loans on real estate totalling $121,160,628 compared with $28,282,712 in 1877; total assets of $167,299,747 as against $30,480,-671 in 1877. The first Canadian building and loan society was established in 1846. Business failures in Canada had a total liability of $12,334,000 in 1873 and of $10,018,299 in 1904.

INSURANCE.

The first fire insurance company in British North America was the Phœnix of London which commenced business in 1804. The first local company was the Quebec Fire Insurance Company established in 1818. In 1869, two years after the union of the Provinces, the total premiums received amounted to $1,785,539 and the losses paid to $1,027,720. By 1904 the totals were respectively $13,-174,815 and $14,113,448—the fires of this year having been exceptional in their extent. During these 32 years the percentage of losses to premiums amongst all companies doing business in Canada averaged 69.91. The total premiums received by Canadian Companies was $44,979,764 and losses paid $31,224,193; by British Companies they were, respectively, $132,883,289 and $92,659,510; by United States Companies they were $23,717,499 and $16,-440,049 respectively.

In life insurance the first company doing business in Canada was the Scottish Amicable Life Assurance Society whose license expired in 1878. The first local company still in existence was the Canada Life Insurance Company which started in 1847 with a capital of $400,000. In 1869 there was a total insurance of $35,680,082 in force in Canada. This had grown in 1904 to $587,873,767.

Life insurance in Canada based upon the assessment plan totalled $133,434,000 in force in 1904 with claims of $1,227,633 paid, 13,755 certificates reported as taken and 118,779 actually in force, with $1,664,091 paid in by members during the year. The Inland Navigation and Ocean Marine insurance business of 1903 included premiums of $620,429 received upon the first and $694,016 upon the second with losses respectively of $421,862 and $593,924. The plate-glass insurance of 1902 showed premiums of $102,894 and losses of $36,579; the guarantee business had premiums of $156,683, policies of $38,888,705 in force, and losses of $37,769; the accident business showed premiums of $811,003, policies in force of $124,334,747 and losses of $344,083; the employers' liability insurance had premiums of $488,935, policies in force of $26,141,616 and losses of $249,997.

CANADA BALSAM: a kind of turpentine (q.v.) obtained from the Balm of Gilead Fir (*Abies* or *Pinus balsamea*), a native of Canada and the n. parts of the United States: see FIR. It exists in the tree in vesicles between the bark and the wood, and is obtained by making incisions, and attaching bottles to it to flow into. It is a transparent liquid, almost colorless and with an agreeable odor and acrid taste.

It is the finest kind of turpentine obtained from any of the *Coniferae*. It has a variety of uses in the arts as an ingredient in varnishes, in mounting objects for the microscope, in photography (q.v.), and by opticians as a cement, particularly for connecting the parts of achromatic lenses to the exclusion of moisture and dust. Its value for optical purposes is very great, not only from its perfect transparency, but also from its refractive power, which is nearly equal to that of glass. See BALSAM.

CANADA GOOSE: see GOOSE.

CANADIAN, a. *kă-nā′dĭ-ăn:* of or from Canada: N. a native or inhabitant of.

CANADIAN RIVER, a river that rises in the northeast part of New Mexico, and runs generally east through Texas and Indian Territory to the Arkansas. Its length is about 900 miles. Its largest tributary is the Rio Nutria, or North Fork of the Canadian, which runs parallel to the main stream for about 600 miles.

CANADIAN SERIES, the lower of the two series into which the rocks of the Ordovician system are divided by American geologists. It comprises the Chazy and calciferous stages, principally limestones, and grades upward into the Trenton.

CANAIGRE, *kăn-ā′gr*, a species of dock (*Rumex hymenosepalus*) indigenous to the arid region of southern California, Arizona, New Mexico, northern Mexico and western Texas. It is a perennial herb with tuberous roots from which a reddish or green stem rises to a height of about two feet and bears rather large leaves resembling those of other docks. The tubers, which resemble those of dahlia, have long been used locally as a source of tannin, and fairly successful attempts have been made to grow them upon a commercial scale for this purpose. Propagation is easily effected by means of the tubers, about 2,000 pounds of which are required to plant an acre.

CANAILLE, n. *kă-nāl′* [F. *canaille*, the mob—from It. *canaglia*, the rabble]: the lowest people: the rabble.

CANAJOHARIE, *kăn-a-jo-hăr′re:* village and township of Montgomery co., N. Y., on the s. bank of Mohawk river, 55 m. w.n.w. of Albany; opposite Palatine Bridge, a station on N. Y. Central railroad. The Erie canal passes through it. The village, incorporated 1829, has several churches, an academy, a weekly paper, banks, and several industries. Pop. (1910) 2,273.

CANAL.

CANAL. These artificial waterways are of enormous value to commerce in shortening distances by water, and in competing with railways, thus reducing freight rates. Transportation by water is the cheapest form of freight carriage known, provided the route is sufficiently direct. Canals were common before railways, and they continue to be built, sometimes to compete with railways, but more often to extend inland waterways by connecting rivers with lakes, or to shorten ocean travel by cutting a neck of land or isthmus.

Early Canals.—Tradition says that a canal existed at the Isthmus of Suez 1600 years B.C. Harcourt states that a shallow canal was there 600 to 800 A.D., but was allowed to fall away. The Imperial Canal of China is probably over 1,000 years old. The Dutch began to dig canals in the 12th century, and in 1560 finished the canal connecting Brussels with the Scheldt. The Languedoc Canal in France, from the Bay of Biscay to the Mediterranean Sea, 148 miles, was finished in 1681, at a cost of over $7,000,000. Canal building began in Great Britain in 1572. The first canal of consequence in the United States was the Middlesex, opened in 1804, from Charleston, Mass., 31 miles, to Concord, N. H. Its depth was only 4 ft., and it has not been used since 1851.

From 1810 to 1840 there was a great energy in canal building in the United States, and a system of barge canals 4,200 miles in length was constructed, covering mainly territory from New England through New York and Pennsylvania to Virginia, and westward through Indiana. Many of these fell into disuse with the advent of railways, but about 40 still remain.

Development.—The railway seems to have gained its ascendency over the canal because it did not freeze up and stop traffic in winter, and because it insured quicker transportation, being therefore useful for passengers as well as freight traffic. It could also be built and operated where canals were impossible. Canal building in the United States began to decline at the time when railway building became active, about 1840. All the United States canals of this early period were designed for the transportation of barges or canal-boats. They were usually 4 ft. deep, and when of 6 ft. depth were regarded as of abundant capacity. The barges were towed by mules or horses connected by a tow-rope, the animal travelling on a tow-path beside the canal. A horse can transport a greater load in this manner than in any other way. In fact, the cost of drawing a ton of freight one mile (this being the ordinary unit of freight transportation) is much below that of similar transportation by rail. The reasons for these low costs are that the canal is inexpensive to maintain, that it involves little machinery, and that it is possible for the animal to pull many hundred times his weight in barges at a speed of about 3 miles an hour.

Endeavors to use steamboats on canals have failed because the agitation of the water by paddle-wheels and

propellers washes away the canal banks. Electric haulage has been tried, however, and has proved acceptable in a few instances, the boats being run at slow speed.

Many canals are laid out so that rivers can be used as a part of their routes, and in such cases the rivers are 'canalized.' This is done by clearing away all obstructions, dredging where necessary, and sometimes building dams to maintain the required depth of water. A towpath also has to be constructed along the river-bank.

In Europe and Canada many of the canals are operated in conjunction with the railways. Where canals can be built cheaply, so as to handle freight economically, they generally have been put in operation. In the United Kingdom of Great Britain there are 1,150 miles of canals belonging to the railways, and 2,800 miles otherwise controlled. The London and Northwestern and Great Western Railways operate over 700 miles of these. In Canada the six systems of Government canals are managed largely in conjunction with the railways. Germany has over 1,500 miles of canals and nearly 1,500 miles of canalized rivers. France has over 3,000 miles of canals. In India about 5,000 miles of canals were built for irrigation purposes, and over a thousand miles of these are now used largely for transportation. In Holland there are 2,250 miles of canals, this being more than the railway mileage. Belgium has over a thousand miles of canals, these being so connected with the rivers as to give a complete inland network of navigable waters, with a total length of about 1,500 miles.

Canal Locks.—When a canal connects two waterways at different levels it is necessary to use a lock to raise and lower the barges or vessels. In principle a lock consists usually of two dams, built a few hundred feet apart, the space between being boxed in and forming a lock large enough to hold a vessel. Each dam has big and little gates. If the barge comes upstream the lower gates are opened and the barge floats into the lock. Then the lower gates are closed and the little upper gates opened, while water flows into the lock, raising the barge till it reaches the upper level. Then the big upper gates are opened, and the barge floats out into the higher water. Reversal of the process allows the barge to descend to the lower level. It is apparent that by this system water is constantly lost to the lower levels. Therefore no lock canal can be maintained except where there are streams to feed it with enough water to keep the upper levels supplied.

Ship Canals.—The deepest canals are termed ship canals, because they afford transportation for large vessels. Such canals were not built prior to 1826, when the Hilder Canal was commenced, running from Amsterdam on the North Sea to Hilder, a distance of 51 miles. It was completed in 1845 to a depth of 20 ft. Its existence is a prime cause of the advanced commercial position of Amsterdam. In the 60's the traffic increased

so that a larger and shorter canal was decided on, this being named the North Sea Canal. It was finished in 1876, to a depth of 23 ft. and a length of 16 miles.

Suez Canal.—This connects the Mediterranean Sea with the Red Sea, separating the continents of Asia and Africa, at the Isthmus of Suez in Egypt. It was begun in 1859 and completed in 1869. The length of the canal proper is 90 miles, but including small lakes taken in the route the distance is 98 miles between termini. The original depth was 25 ft., which was increased to 31 ft. between 1898 and 1902. The first excavation was 80,000,000 cubic yards, the final total being nearly 100,000,000, and the cost over $100,000,000. In 1870, 486 vessels passed through the canal, with a net tonnage of nearly 500,000. In 1895, 3,434 vessels passed having a net tonnage of 8,500,000, and the receipts were $17,600,000. In 1903, 3,761 vessels passed, with a net tonnage of 12,000,000, receipts were $20,000,000, Considerably more than half of this freight was English. The canal has proved profitable, and in 1903 paid dividends to the shareholders of 12 per cent on the actual cost. The canal is without locks, being at sea level the entire distance. About 18 hours' time is required for vessels to pass through, electric lights being used along the route to enable vessels to make headway at night without danger. Steamers make the passage propelled by their own power. The freight charge is the equivalent of $2 per ton of 2,240 lbs. The value of the freight passing through the Suez is larger than that of any other canal, though the tonnage is less than that of St. Mary's Canal.

Panama Canal.—See PANAMA.

St. Mary's, or Sault Ste. Marie, Canal.—This is popularly known as the "Soo" Canal, and connects Lakes Superior and Huron at St. Mary's Falls, Michigan. It is only 1½ miles long, but owing to the tremendous traffic in iron ore from the Lake Superior region passes a much larger tonnage than any other canal in the world. It was begun in 1853 and opened in 1855, to a depth of 12 ft., at a cost of $1,000,000. It has been enlarged several times, and in 1907 was 25 ft. deep, had a minimum width of 110 ft., and involved a total cost of over $6,000,000. Of this, $2,250,000 was spent in building the canal proper, $1,000,000 on the Weitzel lock, and $2,800,000 on the Poe lock. This last-named lock will accommodate a large steam vessel nearly 800 ft. long, 99 ft. beam and 22 ft. draft, being the largest lock existing in 1907. Over 15,000 vessels pass through it yearly, and the freight tonnage is about 25,000,000 annually.

Canadian Ship Canals.—Almost alongside St. Mary's Canal, just described, but on the Canadian side of St. Mary's Falls, lies the Canadian canal also named after the falls, and called indiscriminately St. Mary's or Sault Ste. Marie. It is a little more than a mile long, 22 ft. deep, and was completed in 1895. Its largest lock is

900 ft. long and 60 ft. wide. It carries about one-fifth as much freight as the canal on the American side. It is important as being the first link of the following chain of Canadian canals, forming a continuous waterway from the head of Lake Superior to the mouth of the St. Lawrence: Welland, 27 miles; Galops, 8 miles; Rapids Plat, 4 miles; Farrens Point, ¾ mile; Cornwall, 12 miles; Soulanges, 14 miles; Lachine, 9 miles. The most important of these is the Welland Canal, which connects Lakes Ontario and Erie, winding around Niagara Falls. It was opened in 1833, enlarged in 1871, and again in 1900. It is now (1907) 14 ft. deep and has 26 locks, each 270 x 45 ft., and giving a total lift of 327 ft. The cost was $25,000,000.

Kaiser Wilhelm Canal.—This connects the Baltic at Kiel with the North Sea, and was completed in 1895, at a cost of $40,000,000. It is 61 miles long, 29½ ft. deep, and involved an excavation of 106,000,000 cubic yards, or somewhat more than the Suez Canal. It is 72 ft. wide at the bottom, with greater width at points to enable the passing of large vessels. It was constructed largely for the use of the navy, but is of great value to mercantile traffic. It passes more vessels than any other canal in the world, the number in 1903 being over 32,000, though the freight tonnage was less than 5,000,000.

Manchester Canal.—This connects Manchester, England, with the Mersey at Liverpool and the ocean, and was opened in 1894. It is 35½ miles long, was originally 26 ft. deep, and cost $75,000,000. It has been deepened to 28 ft., and the final excavation was 54,000,000 cubic yards. The engineering difficulties included carrying a smaller canal across underneath, and altering the grade of five railways to carry them 75 ft. above the canal. This canal was constructed by the city of Manchester to replace the old Bridgewater Canal, and though largely used the cost was so great that the income has not paid the interest. In 1906, however, the tonnage passing through rose to over 4,000,000, placing the enterprise nearly on an interest-paying basis.

Cronstadt Canal.—The Bay of Cronstadt is connected with St. Petersburg by a 16-mile canal, opened in 1890, with a depth of 20½ ft. This is the most important canal in Russia, and cost about $10,000,000.

Corinth Canal.—This connects the Gulfs of Corinth and Ægina, and was completed in 1893. It is only four miles long, but reduces the distance from Adriatic ports about 175 miles, and from Mediterranean ports about 100 miles. It is a sea-level canal, 26½ ft. deep, and cost $5,000,000.

Caledonian Canal.—This, the only important canal in Scotland, connects Loch Eil and Moray Firth on the North Sea, the distance between the terminals being 61 miles. It is 17 ft. deep and cost $7,000,000.

Cost of Maintenance.—Ship canals are costly to keep up, as well as to construct. The Suez Canal has to be

dredged all the time to carry away the drifting sand; the pilotage is also heavy, so that the total annual charge for operation is $13,000 a mile. The Kaiser Wilhelm costs $8,600 per mile a year, and the Manchester Canal $9,500 a mile annually for maintenance. With these two the operation of the locks is a large item. The cost of maintaining the one and one-half miles of the United States St Mary's Canal is about $90,000 a year, the short distance and the great traffic, which is all handled during eight months of the year, make the total high as calculated by the mile.

Barge Canals.—Among foreign canals and canalized rivers that are too shallow for large shipping, and hence may be generally classified as barge canals, are the following:

England.—In the Leeds district there are three canal routes from Hull through Goole by different routes to Liverpool, being respectively 147, 160 and 190 miles in length. In the Liverpool district, in addition to the Manchester ship canal, there are five allied systems of barge canals, with a total of 206 miles, the largest being the Ellesmere, running from Carreghofa to Hurleston, 86 miles, and the Birmingham and Liverpool Canal, 53 miles. In the London district is the short but historic Regent's Canal, opened in 1820; the Grand Junction, running along the rivers Brent, Colne, Gade and Bulbourn for 140 miles; and the Surrey, four miles long, which is right in the metropolis.

Ireland.—The Grand Canal, 186 miles long, is the most important, running from Dublin to the Shannon, and including the canalization of several of its tributaries. It was opened in 1800, and cost $10,000,000 with improvements up to 1900. The Royal Canal, from Dublin to Cloondara, is 96 miles long, and the canalized Shannon River, operated by the Government, extends 158 miles.

France.—In addition to the Languedoc, the Seine River has been canalized for 155 miles from Paris to Rouen, and the Rhone 205 miles from Lyons to the sea. The St. Quentin Canal is 58 miles long, and especially noteworthy as having a subterranean passage of 3½ miles. The Bourgogne Canal also has a two-mile tunnel, on which electric haulage is used.

Germany.—The Elbe and Trave Canal connects the North Sea and the Baltic. It is 41 miles long, 72 ft. wide and 10 ft. deep, and was finished in 1900, at a cost of $5,000,000. Much of the Rhine, Elbe, Ems, and Moselle rivers is canalized, and minor waterways are also made navigable and connected. About $10,000,000 was appropriated about 1903 for improving the canal section from Dortmund to the Ems.

Holland.—In addition to the North Sea Canal, Holland has a valuable waterway in the Cologne Canal to the Rhine. It was enlarged in 1903, at a cost of over $8,000,000, making it 144 miles long and 10 ft. deep.

Belgium.—The canalization of the Meuse was com-

p'.ted in 1880, costing $5,000,000. The connecting canal from Boscholt to Antwerp is 54 miles long. The Charleroi-Brussels Canal, finished in 1882, is 45 miles long.

United States Canals.—The Erie is the longest canal in the United States, 387 miles from Albany to Buffalo. It is also the longest in the world that does not include some river or lake as a part of its route. It has 72 locks, and was completed in 1875 to a depth of 4 ft. Later it was deepened to 7 ft., and then to 9 ft. Its original cost was about $7,000,000. Up to 1906 the total cost was $52,000,000, and in that year the State of New York adopted a plan for deepening it to 11½ ft., at an estimated expense of about $100,000,000. The cost of transportation on the Erie Canal is less than anywhere else in the United States, and probably the lowest in the world, being about one-third to one-quarter of the cost of the railways that parallel the route.

The Chicago drainage canal is unique in that its primary purpose is to carry away the sewage from Chicago to the Illinois River at Lockport, thus stopping the fouling of the shores of Lake Michigan. This is the largest canal of its kind, being 30 miles long and 22 ft. deep. It was completed in 1900 at a cost of $34,000,000, and is used for transporting freight as well as for drainage, for this purpose having a connection with Lake Michigan. The Ohio Canal, completed in 1835, from Cleveland to Portsmouth, is 317 miles long, and cost nearly $5,000,000. It has 150 locks, which is a record figure for this continent. The Miami and Erie, completed in 1835, from Cincinnati to Toledo, is 274 miles long, has 93 locks, and cost $8,000,000. The Pennsylvania Canal, running through Columbia, Northumberland, Wilkesbarre and Huntingdon. Pa., was opened in 1839, and is 193 miles long. The cost was nearly $8,000,000. The Chesapeake and Ohio Canal, from Cumberland, Md., to Washington, D. C., 184 miles, was opened in 1850, and cost $12,500,000. The Lehigh Canal, from Coalport to Easton, Pa., 108 miles, was opened in 1821, and cost $4,500,000. The Morris Canal, from Easton, Pa., to Jersey City, N. J., 103 miles, was opened in 1836, and cost $6,000,000. The Illinois and Michigan Canal, the only remaining U. S. canal that is over 100 miles long, extends from Chicago to La Salle, Ill., was opened in 1848, at a cost of $7,500,000. The Harlem River ship canal, connecting the Hudson River and Long Island Sound by way of Spuyten Duyvil creek, was opened in 1895, and cost $2,700,000. Among others existent or of past importance are the canal between the Chesapeake and Delaware bays, across the Delaware isthmus, built 1824-9; 13½ miles long, and supplied by pumps for 10 miles of it. The Delaware & Raritan, 43 miles long, built 1831-4, connecting those rivers, and therefore New York and Philadelphia. The Delaware & Hudson, completed 1820, once the great coal freight route between New York and the Pennsylvania mines; its company transformed itself into the railroad company and abandoned the canal.

CANALAGE, n. *kan-ăl'ĕj:* the construction of canals; the charge for canal transportation. CANALIZE, v.: to convert into a canal, to furnish with artificial waterways.

CANALETTO, *kâ-nâ-lĕt'to,* or CANALE, *kâ-nâ'lā,* ANTONIO: 1697-1768; b. Venice; son and pupil of a theatrical decorator. He studied at Rome. He painted a numerous series of excellent views in Venice, among which those of the great canal are especially admirable for their fresh coloring, faithfulness, and the invention of accessory objects. He went to England by the advice of Amiconai, and acquired wealth and fame by his representations of English scenes, several of which are in Buckingham House, and are highly admired.

CANALETTO, or CANALE, BERNARDO BELLOTTO: 1724–80; b. Venice; nephew and pupil of Antonio C.: attained high excellence as painter, and also as engraver on copper. He practiced his art in his native place, afterward in Rome, Verona, Brescia, Milan, and Dresden. Correct perspective, powerful effects of light and shade, and beautiful sky-tints, are prominent characteristics of his works. C. visited England, where, among several other excellent works, he painted a masterly interior view of King's College Chapel, Cambridge. He died in Warsaw.

CANANDAIGUA, *kăn-an-dā'gwa:* cap. of Ontario co., N. Y., at the n. end of C. lake, 28 m. s.e. of Rochester, 15 m. w. of Geneva; on the New York C. & H. R. and Northern C. R. R. The industries of C. include ale, pressed brick, anti-rust tin and enameled ware. There are large factories for the production of wheel-spokes, farming implements, wire-fencing, canned fruits and cigars. The power-house and shops of the Rochester & Eastern Interurban Electric railway system are at C. There are several churches and banks. The institutions include the Thompson Memorial Hospital, Ontario Orphan Asylum and an Association Library. C. is the seat of C. Academy, a public high-school and the Granger Place School for Girls. Pop. (1880) 5,726; (1890) 5,868; (1900) 6,151; (1910) 7,217.

CANANDAIGUA LAKE: in Ontario co., N. Y., length 15 m., average width, somewhat over 1 m. It is fed by a few small streams; its waters are discharged by the Clyde, Seneca, and Oswego rivers, into Lake Ontario, than which it is 437 ft. higher, being 668 ft. above the sea. Its banks are high, and the surrounding country fertile and well cultivated. Steamers ply upon it daily during the season.

CANANORE, *kân-a-nōr:* seaport and military station of the dist. of Malabar, in the presidency of Madras: lat. 11° 52′ n., long. 75° 26′ e.; about 50 m. n. of Calicut. The town stands at the head of a bay, which opening from the s., forms its harbor, while the fort and cantonments occupy the bluff headland, which shelters the inlet on the side of the Arabian Sea. Besides pepper,

grain, and timber, the neighborhood produces immense quantities of cocoa-nuts, largely exported to the n., where they are said to be scarce. C. has been a British possession since 1791, having in that year been taken from Tippoo Sultan. Pop. 28,000.

CANARA, *kâ-nâ′ra:* region on the w. coast of the Indian peninsula, comprising two British collectorates.—North C., called also *Honawar*, the most southerly portion of the Bombay province, is like the other districts on the coast southward, exceedingly fertile; 3,911 sq.m.; pop. about 421,840—South C., a narrow strip of hilly and very fertile country, is in the Malabar like the preceding, but is comprised for administrative purposes in the province of Madras. It is called sometimes *Mangalore*, from its chief town. Area, 3,902 sq.m., pop. about 1,000,000.

CANARAC, *kâ-nâ-râk′:* town on the Orissa coast at the n.w. angle of the Bay of Bengal; lat. 19° 54′ n., long. 86° 10′ e.; 235 m. s.w. of Calcutta. It is remarkable chiefly for the remains in its vicinity of a colossal pagoda. The entire area, a square of about 13 acres, is said to have been surrounded by walls 150 cubits high and 19 broad; and the principal materials appear to have been red granite and black basalt, some of the blocks measuring 15 or 16 ft. in length, by 6 or 8 ft. in width, and 2 or 3 ft. in thickness. Most of the sculptured embellishments have been removed to the temple of Juggernaut, which is in the same district of Pooree as Canarac itself.

CANARD, n. *kă-nârd′* [F. *canard*, a duck, a drake]: a story got up to gull the public; a hoax.

CANARIES, *ka-nā′rēz*, or Canary Islands *ka-nā′rē:* group of islands belonging to Spain, in the Atlantic Ocean, off the n.w. coast of Africa; lat. 27° 40′—29° 25′ n., long. 13° 25′—18° 16′ w.; forming a Spanish province. The group consists of seven large and several small islets; total about 3,800 sq. m.; pop. (1900) 358,564. The principal islands proceeding from e. to w., are Lanzarote, Fuerteventura, Gran Canaria, Tenerife, Gomera, Palma, and Hierro or Ferro. The coasts are steep and rocky, and the surface is diversified with lofty mountains (the greatest elevation being attained in the *Pico de Teyde*, in the island of Tenerife, 12,182 ft.), narrow gorges, and fertile valleys. All the islands are of volcanic origin. On the summits of the highest elevations, depressions, like those left by fallen cones of volcanoes, are almost everywhere found; and the steep declivities are marked by deep fissures, of which, usually, only one penetrates the depressed summit, and exposes to view the several strata of the volcanic rock. There are numerous torrents but no rivers, and fresh water is very scarce in the s. parts of the islands, and especially in Hierro.

The researches of Humboldt and Von Buch led to the division of the botanical geography of Tenerife into five distinct regions. The first, or region of African forms of

vegetation, extends to about 1,300 ft. above the sea, and is marked by the growth of the date palm, sugar-cane, dragon's blood tree, etc. The second region extends to the height of 2,800 ft., and produces vines, corn, maize, olives, chestnuts, etc., in luxuriance. This zone represents the vegetation of s. Europe. In the third region, about 1,200 ft. higher, are laurels and evergreens. In the fourth, extending to above 6,000 ft., vegetation is nipped by cold and excessive dryness, snow falling several months of the year, and only the *Pinus Canariensis* and other *Coniferæ* flourishing. The fifth region attains an elevation of nearly 11,000 ft. Here are found a kind of *Spartium* (Broom) peculiar to this zone, with cedrine junipers, and one Alpine plant, *Arabis alpina*. The barren mountain-peaks are just below the limit of perpetual snow, although in a cavern 11,000 ft. above the sea, snow is said to remain throughout the year. All the rest of the islands are similar in character, with the exception of Fuerteventura and Lanzarote, which are less elevated, more abundantly wooded, and more luxuriant in vegetation generally.

Minerals are few, and of little importance. Near the sea, the general temperature ranges from 60°—66° F. in Jan., to 78°—87° F., in Oct. The rainy season lasts from Nov. to Feb.; from Apr. to Oct. the weather is uniformly fair. The islands, however, suffer much from the e. and s.e. winds, which, blowing over the hot deserts of Africa, burn up vegetation, and generate disease. For a time the famous vine-produce of the island was almost annihilated by disease in the vines; and as cochineal, before the development of aniline dyes, was worth over a dollar a pound, the cactus on which the cochineal insect feeds soon covered a great part of the area formerly devoted to vineyards. Cochineal having fallen to 16 or 20 cents a pound, the culture of the vine is again attended to with care; and tobacco, coffee, sugar, fruits, and other crops for which the soil and climate of the various islands are suitable, were in 1884 being increasingly grown.

Tenerife, the largest island of the group, has 877 sq. m.; pop. 112,000. In the n.w. of this island, principal seat of the cochineal cultivation, is the famous Pico de Teyde, or Peak of Tenerife (q.v). The chief town and port is Santa Cruz de Santiago (q.v.), on the n.e. coast.

Gran Canaria, next in importance, has 758 sq. m.; pop. 80,000. Its culminating peak is El Cumbre, 6,648 ft. The capital, Las Palmas (q.v.), on the east coast, is the largest town of the archipelago.

Palma has 718 sq. m.; pop. 36,000. Its highest peak, Pico de los Muchachos, has an elevation of more than 7,600 ft.; capital, Santa Cruz des las Palmas (q.v), on the e. coast.

The area and pop. of the other islands are as follows: Lanzarote, 323 sq. m., pop. 19,000; Fuerteventura, 326 sq. m., pop. 15,000; Gomera, 169 sq. m., pop. 13,000; Hierro, 82 sq. m., pop. 5,000. The chief towns of these islands are small.

Formerly the first meridian of long. passed through Hierro.

The C. are supposed to have been the Fortunate Islands of the ancients. The Carthaginians are said to have visited them, and Juba II., king of the two Mauritanias, wrote an account of them that has been transmitted by Pliny. In modern times the first account of them was furnished in the first half of the 14th. c., by the crew of a vessel that had been driven among them by stress of weather. A Spanish gentleman obtained a grant of them from the pope; but when an attempt at settlement was made, the Spaniards were driven off by the natives. In the beginning of the 15th. c., the Spaniards succeeded in obtaining a footing; but a difference having arisen with Portugal concerning them, it was not until 1493 that the authority of Spain was finally established. Since that time, they have remained attached to the Spanish crown. The Guanches, a brave and intelligent race, the aborigines of the islands, have long ceased to exist as a separate people, the population being now quite Spanish.

CANARIS, or KANARIS, *kâ'nâ-rĭs*, CONSTANTINE: abt. 1790–1877, Sep.; b. on the island of Ipsara: Greek patriot. As captain of a merchant vessel he inflicted great damage on the Turks by means of fireships at Scio and Tenedos, 1822, and preserved the Greek fleet. He won a victory near Mycale, 1824, Aug. 17, saving Samos from destruction. 1825, Aug. 4, he attempted to burn the Turkish fleet at Alexandria, but was baffled by contrary winds. C. held various offices under Capo d'Istria and King Otho but took offense at the Bavarian despotism, resigned his posts and orders, and refused, 1861, a pension of 12,000 francs and the title of vice-admiral. He became prime minister 1862, took part in bringing Prince George of Denmark to the throne 1863, and was minister of marine and pres. of the council 1864–5. He died at Athens.

CANARIUM, *kan-ar'iŭm:* genus of trees of the nat. ord. *Amyridaceæ,* natives of the s.e. parts of Asia, the Malayan archipelago, etc. The fruit is a drupe. The kernel of the fruit of *C. commune* is eaten both raw and roasted; and in Amboyna, bread is made of it, usually in the form of rolls about a yard long and an inch thick. An oil is expressed from it, which is used for the table and for lamps. The tree is about 50 ft. high. *C. sylvestre* also produces eatable kernels. *C. commune* is supposed to be one of the trees which yield ELEMI (q.v.), and *C. microcarpum* yields an oil very like copaiva, known in ship-building yards as DAMAR (q.v.).

CANARY, n. *kă-nā'rĭ* [F. *canari;* OF. *canaries,* a bird from the *Canary* Islands]: a wine from the *Canary* Islands; a fine song-bird of yellowish plumage. CANARY-SEED, the grain of *Phal'ăris canărĭen'sis,* ord. *Gramin'ĕæ,* much used as food for small domesticated birds. CANARY-WOOD, n. the timber of *Persea indica* and *P. canariensis,*

from S. America. It is a sound, light, orange-colored wood, used for cabinet work, musquetry, and turning.

CANARY, *ka-nā-rĭ*, or CANARY BIRD: beautiful little bird, very common as a cage-bird, esteemed for its musical powers. It is one of the numerous family of finches (*Fringillidæ*), and is *Fringilla Canaria* of Linnæus. Some modern ornithologists place it in the genus *Carduelis*, others in *Linota;* it is, indeed, intermediate between these genera, the goldfinches and the linnets. Some make it the type of a genus or sub-genus, *Canaria*. It is found in Madeira, the Canary Isles, and the Cape Verd Isles; frequents the neighborhood of human habitations; builds its nest of moss, feathers, hair, etc., in thick, bushy, high shrubs or trees; and produces four, five, or even six broods in a season. In its wild state, its plumage is greenish, or greenish-yellow sometimes tinged with brown, and exhibits less variety and beauty than in domestication. It was brought to Europe in the beginning of the 16th c.

Canary.

It breeds readily in confinement, and seems thoroughly reconciled to its cage-life; but although canaries of long domesticated races sometimes excel in imitative powers and acquired strains, yet they are surpassed in loudness and clearness of note by some of the wild birds, which, when caught and imported, are occasionally sold for extraordinary prices. Even in confinement, the canary often breeds four or five times a year, laying from four to six eggs each time. The eggs are pale blue. The male assists the female in building the nest and in feeding the young. Besides seeds of various kinds, which are their principal food, canaries are very fond of bland green leaves, such as those of chick-weed, a supply of which is necessary for their health; and one of their favorite luxuries is sugar. The canary frequently lives 15 or 16 years. It can be taught various notes and airs, and some even learn to articulate words. The rearing and training of canaries afford occupation to many persons, par-

ticularly in the Tyrol. The canary hybridizes readily with some other species of finch, producing 'mules,' some kinds of which are valued as song birds.—There are several species very closely allied to the canary, one of which, a beautiful little bird, entirely yellow, with an orange crown, a native of Brazil, is sometimes sold as a song-bird, but its musical powers are very inferior to those of the common species.

CANARY GRASS (*Phalaris Canariensis*): grass, of which the seed is much used, under the name of *canary-seed*, as food for cage-birds, and, on that account, cultivated to some extent. It is a native of the Canary Islands naturalized in the s. of Europe, and in some places in Britain, Germany, the U. S. and other countries. The seed is sown early, generally in Feb., yet the crop is not

Canary Grass.

reaped till after the ordinary grain harvest.—This grass attains a height of two or three ft., and has a crowded, egg-shaped, spike-like panicle from an inch to almost two inches long; the spikelets are one-flowered, very much laterally compressed, a rudimentary scale-like floret on each side of the perfect floret; the *glumes* winged on the keel, and with two strips of darker green on each side; the *paleæ* awnless, shining, and at last firmly inclosing the seed. A fine flour is prepared from canary seed, which is employed as dressing in fine cotton-weaving, and for the finishing of silken stuffs. The groats and flour of this small kind of grain are used in the Canary Islands, in Barbary and in Italy, as food also, the flour being made into very nutritious and pleasant bread.—Other closely allied species of *Phalaris* produce a similar grain, but are inferior in productiveness and quality.—A grass, now generally referred to this genus, and called

sometimes Reed Canary Grass (*Phalaris arundinacea*), is very common on the banks of lakes and rivers, and in other wet places in Britain, and throughout s. and central Europe and the U. S. It differs very much in appearance from Canary Grass, having a large spreading panicle, generally of a reddish color; and the glumes are not winged at the keel. It is a somewhat reed-like grass, 4–6 ft. high, with creeping roots, which help to secure river-banks; and yields a great bulk of hay, but has been very generally despised as a coarse grass, fit only for littering cattle. The justice of this opinion has, however, been called in question, and the grass declared to be very nutritious, and sufficiently acceptable both to horses and oxen when cut early. It may be mown twice a year. A variety with curiously striped leaves is well known in gardens, as *Ribbon Grass*, *Gardeners' Garters*, or *Ladies' Traces*. *Phalaris intermedia* is a native species of California.

CANARY PLANT: see Tropæolum.

CANARY WINE, known also as Tenerife: product of the Canary Islands, and resembles Madeira; but the name is properly applied only to the Bidogne wine, which is distinct from the Malvoisie of the Canaries. The former is made from grapes gathered before they have ripened, and, when new, is crude and unpleasant; but in the course of two or three years, increasing in mildness as in age, becomes so much like Madeira, that it is often sold for it. Like Madeira, it is greatly improved by a voyage to the tropics. It is produced chiefly on the island of Tenerife, and the trade in the wine is mostly carried on at the chief port of this island. The Canary of the island of Palma is inferior to Tenerife, but may be consumed sooner, and has a pleasant flavor.

CANASTER, *ka-năs'tĕr* [see Canister]: a rush-basket in which tobacco is placed in Spanish America; hence is said to be derived the name canaster, now applied to tobacco of a certain kind.

CAN-BUOY, or Cone-buoy, n. *-bwôi:* a small buoy having the shape of a cone, employed to mark out shoals and rocks.

CANBY, *kăn'bĭ*, Edward Richard Sprigg, ll.d.: 1819–73, Apr. 11; b. Kentucky: gen. U. S. A. He graduated at West Point 1839, and served in Florida and in the Mexican war, receiving two brevets for gallantry. In 1861–2 he commanded at Fort Craig, New Mexico, and was made brig.-gen. of vols. for a battle at Valverde, which was followed by another at Peralta. He was sent to New York 1863, July, to suppress the draft riots; commanded the div. of w. Mississippi 1864, and 1865 captured Mobile and received the surrender of the armies of Gens, R. Taylor and E. K. Smith. He was twice thanked by Pres. Lincoln, commissioned maj.-gen. of vols. 1864, May 7, and brig.-gen. in the regular army 1866, July 28. Canby was much consulted by the sec. of war, and often

employed on special duties. He took command of the dept. of the Columbia 1869 and was endeavoring to settle the difficulty with the Modocs in n. California and negotiate for their removal from their stronghold in the rocks, when he was treacherously killed under a flag of truce by 'Captain Jack,' a chief, in Siskiyou co., California.

CANCAN, *kăn'kăn:* a sort of wild disreputable dance, practiced at some of the lower resorts for amusement in Paris. It is something of the nature of a quadrille, but accompanied by violent leaps and indecorous contortions of the body.

CANCEL, v. *kăn'sĕl* [L. *cancellārĕ*, to make like lattice-work—from *cancel'li*, a grating: F. *canceller*, to erase]: to deface writing by crossing it; to annul; to destroy: N. anything annulled. CAN'CELLING, imp. CAN'CELLED, pp. *-sĕld.* CAN'CELLA'TED, a. *-lā'tĕd* [L. *cancelli*, a grating of bars, lattice-work, marked with cross lines. CANCEL'LATE, a. *-sĕl'lāt*, lattice-like; consisting of a network of veins. CAN'CELLA'TION, n. *-lā'shŭn*, the act of defacing by crossing with lines.—SYN. of 'cancel': to abolish; efface; obliterate; erase; deface; annul; expunge; repeal; revoke; abrogate; destroy.

CANCELLARIA, *kăn-sĕl-lăr'ĭ-a:* genus of mollusks—class *Gasteropoda* (q.v.), order *Pectin'bran'chiata*—with univalve shells, regarded sometimes as belonging to the family *Volutidæ*, or Volute Shells (q,v.), but now generally placed among *Buccinidæ*, or Whelks (q.v.). The spire is prominent, the last whorl ventricose, the surface reticulated, the mouth large, the columella plaited. All the recent species are natives of tropical or subtropical seas, and are found chiefly on sandy bottoms, at the depth of a few fathoms. Tate estimates the known recent species at 71. The fossil species, amounting to 60, occur in the newer strata from the chalk upward.

CANCELLATION, a method of abbreviating certain arithmetical and algebraic operations. When the product of several numbers is to be divided by another such product, any factors common to both products may be left out, or 'cancelled.' If divisor and dividend do not appear *in extenso* as products, the process of cancellation may yet be applied if common factors exist and can be detected. The work is substantially the same as that of reducing fractions to their lowest terms.

CANCELLI, n. plu. *kán-sĕl'lī* or *kăn-tshĕl'lē* [L. *cancelli*, a lattice, railing]: a fence of rails in a church separating the priests from the people; the small latticed windows of the confessional separating the priest from the penitent; a place railed off for a choir, a tribunal, etc.; in *anat.*, the lattice-like texture of the internal bone. CANCELLOUS, a. *kăn-sĕl'ŭs*, net-like or honey-combed, as the internal substance of a long bone.

CAN'CELLING OF DEEDS and WILLS. The court of chancery in England, and in the United States such courts as have chancery powers, give relief against the

effect of improper cancellation; on the other hand, the court may order a deed which has been improperly obtained to be delivered up in order to be cancelled. But mere cancellation of a properly executed and delivered deed does not of itself void the grantee's title. Where a deed is cancelled by consent of the parties to it, it is thereby destroyed as to their interest under it, but third parties may still produce it in evidence. As to a will, its cancellation may have the effect of revoking it, if done with such intention.

In the United States, the law usually is that a *will* can be cancelled only by the 'testator himself, or in his presence and by his direction and consent.' It appears that where a testator has prescribed certain forms for the authentication of his will, and such forms have either not been observed by him, or if observed, have, in some essential particular, been negatived by obliteration, an intention to revoke will be presumed. A will, however mutilated or cancelled by a testator during his insanity, would be good; and of course there is no effectual cancellation when done by a third party without sufficient authority. But all such considerations are questions of evidence. See DEED: WILL.

CANCER, n. *kăn'sėr* [L. *cancer*, a crab, an eating sore: AS. *cancre:* It. *cancro:* F. *chancre*]: a spreading sore on the body or in some internal part, very painful and very fatal; a crab; one of the signs of the zodiac. CAN'CERATE, v. *-āt*, to grow into a cancer. CAN'CERATING, imp. CAN'CERATED, pp. CAN'CERA'TION, n. *-ā''shŭn*. CAN'CEROUS, a. *-sėr-ŭs*, like a cancer. CAN'CEROUSLY, ad. *-lĭ*. CAN'CEROUSNESS, n. CANCRIFORM, a. *kăng'krĭ-fawrm* [L. *forma*, shape]: cancerous; having the form of a cancer or crab. CAN'CRINE, a. *-krĭn*, having the qualities of a crab. CAN'CROID, a. *-kroyd* [Gr. *eidos*, form]: pertaining to a crab; cancer-like. TROPIC OF CANCER, that parallel in the northern hemisphere whose latitude is equal to the sun's greatest declination, about 23° 28′: see TROPICS.

CANCER, *kăn'sėr:* a malignant new growth or tumor. By the term *malignant* is meant that the tumor is persistent and relentless in its growth, constantly invading new tissue and often reproducing itself in distant parts of the body by what is called 'metastasis'; the tumor is prone to recur, after removal, in the scar of the operation wound; and the sufferer from a cancerous tumor finally dies from weakness and infection of the general system. Death from cancer is not invariable, for if the tumor is removed at a very early stage it may never recur, and the new growth has been known to grow smaller and finally disappear under various forms of treatment, or even spontaneously. Moreover, it is important to observe that not all, nor even the majority, of morbid growths are cancerous. A very large proportion of tumors are either determined by a previous process of inflammation—leading to chronic abscess and induration—or belong to

what is called the non-malignant or benign order of tumors —e.g., cysts, fatty and fibrous tumors, simple hypertrophy of glandular structures, cartilaginous, bony, calcareous, and vascular growths: see TUMORS. Further, among the tumors admitted by general consent into the order of cancerous, there are widely different degrees of *malignancy*, some having the tendency to spread rapidly, and infect the system at an early period, while others remain local for a considerable time, and may be removed while yet local with good hope of a permanent recovery.

In addition to cancer (*carcinoma* is the scientific term) there are other forms of malignant growths, the chief among which is *sarcoma* (q.v.). In popular speech no distinction is made between carcinoma and sarcoma, both being spoken of as cancer; and even surgeons often apply the same term in all forms of malignant new growths. The present article deals with carcinoma, or true cancer, as distinguished from sarcoma.

The most common seats of C. are, among external parts, the female breast, the eye, the tongue, the lip, the male genital organs, and the bones; among internal organs, the liver, stomach, uterus, rectum, gullet, peritoneum, and lymphatic glands. Some of these parts are more liable to primary, others to secondary cancer. Thus, the female breast, the neck of the uterus, the lower lip, and the scrotum are often the seats of a single cancerous tumor, which in its early stage at least seems unconnected with any constitutional taint; while the liver, the bones, and the lymphatic glands are more frequently the seats of secondary or multiple cancerous tumors. There are also differences in the character of the C. itself, apart from its anatomical seat, which are to be taken into account in estimating the probability of its being solitary. Some of these differences are regarded by pathologists as amounting almost to specific distinctions; thus, *scirrhus*, or hard C., observed most frequently in the breast, uterus, and stomach, is more frequently solitary than *encephaloid* (brain-like), otherwise called *medullary*, or soft C.; again, *melanosis*, or *melanic* C., a variety charged with a brown or black pigment, is almost always multiple in its occurrence; while *epithelial C.*, or *epithelioma*, of which examples are frequently found in the lip, scrotum, or tongue, is so generally solitary as to have led some pathologists to place it in a class altogether apart from the truly cancerous growths.

Generally speaking, a tumor may be said to fall under the suspicion of being C. when it more or less completely infiltrates the texture in which it arises, and passes from it into the surrounding textures; when it invades the lymphatic glands adjoining the part first affected; when it is attended by stinging or darting pains, or by obstinate and slowly extending ulceration, not due to pressure; when it occurs in a person having impaired health or past the middle period of life, and is not traceable to any known cause of inflammatory disease or local irritation,

nor to any other known constitutional disease, such as syphilis or tuberculosis. The probabilities are of course increased if the tumor be in one of the habitual seats of C., or if it be attended by evidence of disease in some internal organ known to be frequently thus affected. But the diagnosis of C. is often very difficult, and it may be necessary to examine a portion of the growth under the microscope before its nature can be determined. When a tumor appears in certain situations, as in the breast, or at a certain time of life (after 45 years, let us say), it is always advisable to have it removed in view of the possibility of its being malignant in character. If it was benign in character no harm has been done and the patient has got rid of a disfigurement; if it was cancerous its early removal may have saved the patient's life.

What is really known as to the cure of C., may be stated in few words. Modern pathological researches render it probable that a complete suspension of the progress of C., sometimes, though rarely, takes place; and individual tumors are found not unfrequently to undergo partial healing, or even to become entirely metamorphosed into inert cicatrices, while others, associated with them, continue to advance. The degree of rapidity of the advance of C. is also, as we have already stated, exceedingly variable. But these observations modify only to a very slight degree the general doctrine, that C. is a disease tending to a fatal issue, and hardly, if at all, under the control of remedies, as to its ultimate result. The removal of a cancerous tumor, indeed, is still resorted to by surgeons; and there appears to be no reasonable doubt that when performed early, and in well-selected cases, it has been followed by long continued exemption. But the occasional spontaneous arrest of such growths on the one hand, and the doubtful results of operation in a large proportion of cases on the other, have combined to render surgeons of late years more chary of the use of the knife. In very aged persons, in particular, the question often resolves itself into a calculation of the chances of life, founded on a great number of conflicting data, and only to be solved by a careful attention to the state of the general health, as well as to the rate of progress of the local disease. Operations are now very rarely performed after the lymphatic glands are involved, or when there is evidence of a deteriorated constitution, or of internal disease; but sometimes great pain, or profuse and exhausting discharge from an external tumor, may justify its removal, as a palliative measure, even under these unfavorable circumstances. For the mode of removal of cancerous and other tumors, see TUMORS.

Various internal remedies have been proposed from time to time for the cure of C., but none of them has yet proved its therapeutic value. It is not impossible that a remedy for C. (other than removal by the knife of the surgeon) will eventually be found, and many

think that this remedy will be in the nature of an antitoxin or serum. This belief is held by those who regard C. as due to the invasion of the organism by a microbe, either animal or vegetable. Other theories of the causation of a C. are that it starts from a bit of embryonic tissue accidentally remaining in the adult body; that it is a product of autointoxication, in proof of which it is asserted that the disease affects chiefly large eaters of meat and high livers and overeaters in general.

Among the lower animals, this disease is more rare; nevertheless, cases are not unfrequent presenting the same malignant characters as those observed in the human subject. Usually manifesting itself in the form of a specific tumor of some organ or tissue, there is a tendency to the invasion of other parts of the system, and the development of a constitutional state called the cancerous cachexia. The dog and cat are most frequently affected with C.; and next in frequency come the pig, ox, horse, and mule. Rats and mice are also subject to malignant tumors, and experiment has shown that the disease may often be transmitted from one to another of these animals by the insertion into the tissues of a healthy mouse of a bit of cancerous tissue removed from another mouse.

CANCER, the *Crab:* fourth of the 12 constellations of the zodiac, usually represented on the globe as a crab,

and denoted in works on astronomy by the sign ♋, which resembles the number 69 laid sideways. It contains, according to Flamsteed, 83 stars, of which the principal is *Acubens,* a star of the third magnitude. In the divisions of the ecliptic, the *sign* called C. occupies a place between 90° and 120° from the vernal equinox; but owing to precession, the sign and the constellation have not coincided for nearly 2,000 years. See Ecliptic Precession: Zodiac, Annexed is a representation of the constellation, which is one of the least striking in the zodiac. Besides Acubens, it has two stars of the fourth magnitude, called by the Romans *Aselli* or the Little Asses; and a nebulous cluster of minute stars about 2° from the Asses, visible to the naked eye, and which goes by the name of *Præsepe,* or the Manger.

CANCER: see CRAB.

CANCER ROOT, or BEECH-DROPS (*Epiphegus Virginiana*): parasitic plant of the nat. ord. *Orobancheæ* (q.v.), native of N. America, growing almost exclusively on the exposed roots of beech-trees. Like all the other plants of its order, it has a curious appearance, having scales instead of leaves. Its stem is branching, and produces distant alternate white flowers, streaked with purple. The whole plant is powerfully astringent; and the root is brownish, spongy, and very bitter and nauseous in taste. It has acquired, in its native country, the reputation of being a cure for cancer. All parts of the plant are used, and externally more than internally. This plant, in conjunction with white oxide of arsenic, is believed to have formed a medicine once famous under the name of *Martin's Cancer-powder*.—Another American plant of the same order, *Phelipæa biflora*, is sometimes also called Cancer Root, and is used in the same way; and an infusion of the Common Broomrape (*Orobanche major*)—native of Britain, and of the s. of Europe, parasitic on the roots of broom, furze, and other leguminous plants, has been employed as a detergent application to foul sores.

CANCRUM ORIS, *kăn'krŭm ō'rĭs*, known also as *Noma*, *Water-cancer*, and *Water-canker:* peculiar form of mortification, arising apparently from defective nutrition. The disease seldom occurs except between the second and eleventh years, and is usually preceded by measles, remittent or intermittent fever, or some other serious disease. The following is the ordinary train of symptoms: more or less general disturbance of the system, accompanied by loss of appetite, followed by swelling of the salivary glands, and a profuse flow of saliva, which escapes from the mouth involuntarily during sleep; ulceration of the gums, which swell and become livid; looseness of the teeth; and the appearance of ash-colored spots on the gums and adjacent mucous membrane, which turn into dark-colored, sloughy sores. These sores spread rapidly by a gangrenous process, expose the bone, and finally make a large aperture in the cheek. In some cases, the entire cheek has been destroyed in a very few days. The disease occurs most commonly in infant asylums and other institutions where children are housed in large numbers and in close quarters. The obvious indications of treatment are to remove the patient to pure air, to administer tonics, nourishing food, and (in moderation) stimulants; to touch the diseased parts with nitrate of silver or carbolic acid, and to wash out the mouth frequently with a weak solution of Condy's fluid

CANDACE, *kăn'da-sē:* name apparently common to the warrior queens of Ethiopia, i.e., upper Nubia, between the Nile and the Atbara, in the later period of the kingdom of Meröe. The most distinguished of them invaded

Egypt B.C. 22, was defeated by the Romans and obliged to sue for peace, which she obtained, with a remission of the tribute imposed on her by Petronius. One of her successors is mentioned in Acts viii 27; her high treasurer was baptized by Philip the Deacon, on the road to Gaza.

CANDAHAR, or KANDAHAR, *kân-dâ-hâr′:* capital of central or s. Afghanistan: about 200 m. s.w. of Cabul: lat. 32° 37′ n. long. 66° 20′ e., 3,484 ft. above the level of the sea. It is in form oblong, while all its streets run straight, and cut one another at right angles. At the point of intersection there is a large dome (*Charsu*), 50 yards in diameter. Pop. variously estimated from 25,000 to 100,000. Candahar is well watered by two canals drawn from a neighboring river, which send to almost every street its own adequate supply; and the same means of irrigation have covered the immediate vicinity with gardens and orchards. Candahar is a place of great commerce, trading with Bombay, Herat, Bokhara, Samarcand, etc. Among its permanent residents, Candahar has a larger proportion of Afghans, chiefly of the Dooraanee tribe, than any other city of Afghanistan. There are numerous Hindu and Persian merchants. About two m. to the northward rises a precipitous rock, crowned by a fortress impregnable to everything but heavy artillery. Here, amid all the disasters of the war 1839–41, the British held their ground. Candahar has been a pivot for the history of central Asia during more than 2,000 years. It is supposed to have been founded by Alexander of Macedon, owing its name, probably, to the oriental corruption of Iskender or Scander, as in Scanderoon or Iskenderun of Syria. A comparative blank of upward of 13 centuries in its history reaches to the famous Mahmoud of Ghiznee, who wrested the stronghold from the Afghans. From that epoch to 1747, when native rule was permanently established, Candahar, with brief and precarious intervals of independence, was held by Tartary, India, and Persia, in turn. In the war of 1878–80, the British entered Candahar unopposed, and they held the city till 1881, some months after they had evacuated the rest of Afghanistan.

CANDAU'LES: see GYGES.

CANDEISH, or KHANDESH, *kân-dās′:* district in the province of Bombay; 9,944 sq. m. It lies chiefly in the basin of the middle part of the Tapti, and is bounded mostly by territories of nearly all the powerful native princes—the Nizam, Scindia, Holkar, and the Guicowar. Through its situation, it necessarily suffered much from the long contest between the Mohammedans and the Mahrattas, and from the struggles among the rival chiefs of the latter. Accordingly, when in 1818, it fell to the East India Company on the overthrow of the Peishwa, it presented little better than a scene of desolation, with ruined mansions, dismantled towns, and dilapidated temples. But the improvement was regular and steady.

The staple productions are cotton, wheat, and other grains, also a little indigo. The cultivators are generally in a progressive condition, especially in the cotton districts, and the well-watered talooka of Baglan. Pop. 1,500,000.

CANDELABRUM, n. *kăn'dĕ-lā'brŭm*, CAN'DELA'BRA, n. plu. *-brâ* [L.—from *candēla*, a candle: It. *candelabro:* F. *candélabre*]: properly, a large ornamental candlestick with branches; more frequently, a support for a lamp. There were, perhaps, no articles of furniture in which the ancients combined the beautiful with the useful to so large an extent as in their candlesticks and lamps. Candelabra usually stood on the ground or floor, and were of considerable height—from 4 to 8, or even 10 ft. The most common were of wood; but metals of all kinds, including the precious metals, were used in their construction, and sometimes they were even adorned with gems. The candelabra found at Herculaneum and Pompeii are mostly of bronze. In the temples and palaces of the emperors, they were frequently of marble, and of great size and richness. They have usually a capacious cup at the top, either for the purpose of containing oil enough to feed a large flame, or that might be used for burning incense. Though varying greatly in details, a general design runs through the forms of the candelabra of antiquity. They have all a foot or feet, a shaft, and a plinth on which a lamp is placed, or which is furnished with a socket for a candle. The base often consists of three feet of a lion, goat, griffin, or other animal real or imaginary. Sometimes a figure was introduced either into the body of the shaft, or placed on the top of it, in either case supporting the superincumbent portion of the candelabrum on its head. Sometimes a figure was substituted for the shaft altogether, the receptacle for the oil being placed in one hand. In others, the shaft is a sliding one, like that of a music-stand, the object being, of course, to raise or depress the light at pleasure.

In addition to the various kinds of candelabra which, from their height, seem to have stood on the floor, the ancients had others intended to be placed on a table. These consisted either of a pillar or of a tree, and from the capital of the former, or the branches of the latter, lamps were suspended.

CANDENT, a. *kăn'dĕnt* [L. *candens*, p. pr. of *candeo*, I shine, I am white-hot]: in a state of greatest heat, next to fusion; white hot; impassioned.

CANDIA, *kăn'de-â*, in Turkish, 'KIRID',' called in the most ancient times *Idæa*, afterward *Crete:* one of the largest islands of the Mediterranean; at the entrance of the Archipelago, long. 23° 40′—26° 40′ e., lat. 34° 50′—35° 55′ n. It is very irregular in form, its length being about 160 m., and its breadth varying from 6 to 35 m. The history of Candia commences with Greek mythology, and the old historians and poets say, that it was governed by its own kings, among whom were Saturn, Jupiter,

and Minos, 1,300 years before Christ. Candia was conquered by the Romans under Metellus, who, on that account, had the title of 'Creticus;' on the division of the empire, it fell to the share of the eastern monarchs. In A.D. 823, it was conquered by the Saracens, who built the city of Candia on the ruins of Heraclea. In 1204, it was sold by Pope Boniface—to whom Baldwin I. gave it—to the Venetians. In 1645, the Turks besieged Canea, and in 1669 conquered the island, after a war, which lasted 24 years. The Cretans sigh for a union with Greece, and have repeatedly risen in insurrection against Turkish rule, notably in 1866. At the Berlin Congress, 1878, the Porte engaged scrupulously to carry out in Candia the reformed system of government drawn up in 1868.

The island of Candia is for the most part mountainous, the mountains chiefly of freestone or of marble, either gray or white. Toward the s. side of the w. part of the island, there is a chain of high mountains, in length about 37½ m., which, from their appearing white, especially at their west end, were anciently called Leuci. Mount Ida, now called by the natives Upsilorites, is one in a chain of mountains extending to the n.w. of the island almost to Retimo; the mountain is of gray marble, and the surface loose stones: there is no verdure on it except a few small shrubs. In myth. Jupiter is said to have passed great part of his youth among these mountains in the exercise of hunting and drawing the bow.

The island abounds in springs and fountains, which are found even by the sea-side; most of the rivers are dry in summer, but in winter many of them are very dangerous torrents. The island does not show any minerals of importance. The soil of Candia is fertile, and produces wheat in abundance. The exports, chiefly of oil, wool, linseed, and fruit, amount in annual value to above $2,000,000, and the imports to about $2,200,000.

The population is, for the most part, of Greek descent; there are only about 70,000 Turks, with a few Arabs and Armenians, in the island. There are, however, many Greek Moslems in Candia, the worldly advantages which formerly resulted from embracing Islamism having induced whole districts to abandon the faith of their forefathers, but their change of religious faith was unaccompanied by any change of language.

Candia had anciently, according to Homer in his *Odyssey*, 90 cities; there are now only 3 principal towns: Megála Kástron or Candia, pop. 22,774; of which 5,000 are Christians; Retimo or Rhithymnos, pop. 9,311; of which 2,000 are Christians; Canea (q.v.) or Khania, pop. 24,537; of which 8,000 are Christians. The population of the island now numbers less than half its amount at the outbreak of the Greek revolution, 1821; it was (1900) 303,543.

Numerous unsuccessful attempts have been made by the Cretans to throw off the Turkish yoke—in 1821, in

1858, in 1866, in 1877, and again in 1896. The immediate cause of the latest outbreak appears to have been the recall of the Christian governor Caratheodory Pasha and his replacement by a Mussulman, Turkhan Pasha. On 1896, Apr. 24, there was a bloody encounter at Episkopi, in which 50 persons were killed and wounded. Massacres of Christians occurred at Canea and other places on May 24, and during the following fortnight 28 towns were burned by Turkish soldiers. By July 1, the Turkish forces had been increased from the usual 6,000 to 20,000. A concert of the six leading European Powers was brought to bear upon the Porte, resulting in Turkish and Cretan acquiescence in a plan to grant financial and judicial independence to the island under the guarantee of the Powers.

CANDID, a. *kăn'dĭd* [F. *candide*, white—from L. *candĭdus*, white—from L. *candērĕ*, to shine, to be bright: It. *candido*]: white; open; sincere; frank; fair; free from malice. CAN'DIDLY, ad. *-lĭ*, without deceit or reservation; sincerely. CAN'DIDNESS, n. frankness and sincerity. CAN'DIDATE, n. *-dĭ-dāt* [F. *candidat*—from L. *candĭdātus*, clothed in white—persons in Rome seeking offices having worn a white toga without a tunic; partly in ostentation of simplicity, partly to display wounds received in battle]: a person who seeks for a vacant office; one who offers himself as a fit person to fill an appointment. CAN'DIDATURE, n. *-dā-tūr*, the position of a candidate for an office; a canvass. CAN'DIDATESHIP, n. state of being a candidate.—SYN, of 'candid': sincere; cordial; frank; hearty; open; ingenuous; warm; fair; impartial; just; artless; unbiassed; equitable.

CAN'DIDATE [see CANDID]: among anc. Romans, a person seeking a high office. The candidature commonly lasted two years: in the first year, the candidate was proved by the senate, whose decision, if favorable, was ratified by the popular assemblies; and, in the second, his name was entered in the list of candidates. During this period occurred the *ambitio*, or canvassing of voters, which often gave occasion to enormous bribery, in spite of the severe enactments passed to prevent the corruption of the electors. The elected candidate was styled *Designatus*.

In the early Christian church, newly baptized converts were styled CANDIDATES on account of the white garments worn during eight days after baptism. In modern times a German probationer or theological student who has been approved before the highest ecclesiastical authorities, is called a Candidate; also a person seeking political office.

CANDIDE, OU L'OPTIMISME: a famous novel by Voltaire, forming an epoch in French literature. In this book he ridicules the system of optimism with his usual spirit, and attacks revelation with plausible but superficial arguments, aiming to controvert the celebrated maxim of Leibnitz, 'All is for the best in the best of all possible worlds'.

CANDIED, *kăn'dĭd:* see under CANDY.

CANDLE, n. *kăn'dl* [AS. *candel;* L. *candēla*, a candle—from *candĕō*, I shine—*lit.*, a body for shining]: a round body made of tallow or any fatty matter, with a wick in the centre, used to give light; a light or luminary. RUSH-CANDLES, the pith of rushes dipped in tallow. CANDLE-BOMB, a small glass bubble filled with water, which, if placed in the flame of a candle bursts, by the expansion of steam generated from the inclosed water. CAN'DLE-STICK, the stand or stick for a candle. CAN'DLEMAS, n. *-dl-măs*, a quarterly term, Feb. 2; a feast in the Chh. of Eng. and in the Rom. Cath. Chh. in honor of the purification of the Virgin Mary—on which occasion, in the Rom. Cath. Chh. many candles are used, and those intended for use in the churches for the whole year are blessed. NOT FIT TO HOLD A CANDLE TO, not able to be compared with; only able to occupy a very inferior position to — referring to the inferior position of acolytes and others who hold candles in certain acts of worship in the Rom. Cath. Church.

CANDLE, *kăn'dl:* cylinder of wax or fatty matter, with a wick, intended for giving light. Candles are made principally of tallow; also of the solid portion of palm and cocoa-nut oils, bleached wax, spermaceti, and paraffine, and other oily substances found in coal, shale, and gas-tar. They are either dipped, molded or rolled. 'Dips' are made by stretching a number of wicks upon a suitable frame, so that they may hang down at a distance from each other equal to about double the intended thickness of the C.; these are then dipped in a trough of melted tallow, and hung upon a rack until cooled, then dipped again and again, until the required thickness is obtained. The dipper has a number of frames prepared before commencing, and by the time he has dipped the last, the first is cool enough to dip again. The tallow in the trough has to be kept only a little above its melting point, for if it were much hotter, it would melt away a portion of the tallow already on the wick, instead of adding to it. Tallow candles are much improved by being kept a year or a winter before using.

Molds, or mold-candles, are cast by pouring the tallow down a pewter tube, along the axis of which the wick has been previously fixed. These tubes are well polished in the inside, and several are fitted in a frame, the upper part of which forms a trough, into which the moulds all open: thus, by pouring into the trough, all the molds are filled at once.

Wax candles are not molded, on account of the great amount of contraction which wax undergoes in cooling, and the difficulty of drawing it from the molds. The wicks are warmed, and suspended over a basin of melted wax, which is poured over them until they acquire the proper thickness; they are then rolled, while hot, between two flat pieces of smooth, hard wood, kept wetted to prevent adhesion.

Great improvements have recently been made in the manufacture of candles, and these are interesting as results of the progress of scientific chemistry—of theory applied in practice. All oils or fats are composed of one or more fatty acids combined with a base called glycerine. The fatty

acids constitute the combustible and more solid portion of the compound. Both acid and base are very weak, and it is a general law in chemistry, that a strong base, under favorable conditions, will separate a weaker one from its acid, by combining with the acid, and taking the place of the weak base; and a strong acid will in like manner displace a weaker one. Lime is a strong base, and being cheap, is used to separate the glycerine from the fatty acid of tallow, palm-oil, etc. This it does when the melted fat is stirred for some hours with a mixture of lime and water. The lime forms a hard insoluble soap, by combining with the fatty acid, and the glycerine remains in solution with the water. This lime-soap is then broken to powder; and the weak, fatty acid separated by means of sulphuric acid, which combines with the lime, forming sulphate of lime. The whole being heated, the fatty acid floats on the top, is skimmed off, and the candles made from it. These are called composite candles; they give a purer light than ordinary tallow, being freed from the glycerine, which not only softens the fat, but diminishes its combustibility. Pure stearic acid, or stearine, the chief fatty acid of tallow, is a hard crystalline substance, perfectly dry, and free from any greasiness, with a somewhat pearly lustre. Its crystalline structure presents a difficulty in the manufacture of candles, for when cast in molds, it contracts on cooling, and leaves small spaces between the crystals. This has been obviated by mixing a little arsenic with it; but this method is now abandoned, on account of the poisonous gas evolved by the combustion of such candles, and the desired effect is obtained by mixing the stearine with a little wax, and pouring it into hot molds.

To obviate the necessity of snuffing candles, several contrivances have been adopted; in all of them, the object is effected by causing the wick to bend over and its end to fall outside of the flame, and thus, by coming in contact with the oxygen of the air, to be completely burned—for such combustion cannot take place within the flame: see FLAME. This bending over is variously brought about. One method is by twisting the wick with one strand shorter than the rest, which is strained straight while the candles are being cast; and when released by the melting of a portion, it contracts, and bends the wick. Another method is by adding on one side of the wick a paste, consisting of a mixture of borax, bismuth, flour, and charcoal. Another, by coating one of the threads of the wick with a metallic envelope, by dipping it in fused bismuth; the metal fuses at the end of the burning wick, and forms a small globule, which bends the wick over, and is itself readily combustible at a red heat. These are called *metallic* wicks. Various other contrivances have been adopted for the same object. *Paraffine* (q.v.), a white crystalline body, obtained by distillation from cannel coal, etc., affords a beautifully white and clear material for candles, and having thus in a great degree the properties of wax at a much smaller expense, it has lately been much used for

this purpose. *Ozokerit* is another oily mineral substance used for candles.

Candles were early introduced—with symbolical signification—into Christian worship, and are still so employed in the Rom. Cath. Church. In the Church of England, candles are sometimes placed on the altar; but the practice is a subject of controversy. The numerous superstitious notions and observances connected with candles and other lights in all countries had a more remote origin, and may be considered as relics of the once universally prevalent worship of the sun and of fire. Numerous omens are taken from them, and they are also used as charms. The following are some of the waning but still lingering superstitions. In Britain, a portion of the tallow rising up against the wick of the candle, is called a winding-sheet, and regarded as a sure omen of death in the family. A bright spark at the candle denotes that the party directly opposite is to receive a letter. Windy weather is prophesied from the waving of the flame without visible cause, and wet weather if the wick does not light readily. Corpse-candles are lights appearing to spring up from the ground, or issue out of a house, and traverse the road or air by invisible agency; they are ominous of death; their route indicates the road the corpse is to be carried for burial; and the size and color of the light tell whether the fated person is young or old. This superstition lingers chiefly in Wales. It is or was customary in some places to light a candle, previously blessed, during the time of a woman's travail. C. were supposed to be efficacious after death as well as before birth, for they were placed on the corpse. The object was doubtless to ward off evil spirits, who were supposed to be always on the alert to injure souls on entering and on quitting the world. See CANDLEMAS.

CAN'DLEBERRY, or CANDLEBERRY MYRTLE, or WAX TREE, or WAX MYRTLE, or TALLOW TREE, or BAYBERRY (*Myrica cerifera*): small tree or shrub, 4–18 feet high, but generally a low, spreading shrub; native of the United States, but a most abundant and luxuriant in the southern states. It belongs to the nat. ord. *Amentaceæ*, sub-order *Myriceæ*, according to some, a distinct nat. ord., distinguished by naked flowers, with 1-celled ovary, a drupaceous fruit (stone-fruit)—the scales becoming fleshy—and a single erect seed. The genus *Myrica* has male and female flowers on separate plants; and the scales of the catkin in both male and female flowers are concave. The C. has evergreen oblongo-lanceolate leaves, with two small serratures on each side at the point, sprinkled with resinous dots. The bark and leaves when bruised emit a delightful fragrance. The drupes—popularly called berries—are about the size of peppercorns, and when ripe, are covered with a greenish-white wax, which is collected by boiling them and skimming it off, and is afterward melted and refined. A bushel of berries will yield four or five pounds. It is used chiefly for candles, which burn slowly with little smoke, and emit an agreeable balsamic

odor, but do not give a strong light. An excellent scented soap is made from it.—*M. Gale* is the SWEET GALE of the moors and bogs of Scotland, well known for its delightful fragrance, native of the whole northern parts of the world. Several species are found at the Cape of Good Hope, one of which, *M. cordifolia*, bears the name of WAX SHRUB, and candles are made from its berries.

CANDLE-FISH, or EULACHON (*Thaleichthys Pacificus*): remarkable fish of the family *Salmonidæ*, nearly allied to the Capelin (q.v.), and, like it, strictly a sea-fish, approaching the coasts to spawn, but not entering rivers. The C. inhabits the Pacific Ocean, near the w. shores of America, from Vancouver's Island northward. It is not larger than a smelt, has a somewhat pointed and conical head, a large mouth, teeth on the pharyngeals, and the tongue rough, but the lower jaw, palatines, and vomer destitute of teeth. The color is greenish olive on the back, passing into silvery white on the sides and belly, sparsely spotted with dirty yellow. It is probably the fattest or most oleaginous of all fishes, or indeed of animals, and is used by the Indians not only as an article of food, but for making oil. To broil or fry it, is nearly impossible, because it almost completely melts into oil. Indeed, the Indians often use it, in a dried state, as a lamp for lighting their lodges, merely drawing through it a piece of rush-pith, or a strip from the inner bark of the 'Cypress Tree' of these regions, *Thuja gigantea*—a species of arbor vitæ—as a wick, a long needle of hard-wood being used for this purpose; and the fish being then lighted at one end, burns steadily until it is all consumed. In order to use the dried fish for food, the Indians often melt it into oil, by the application of heat, and drink the oil. It is also eaten uncooked. Drying is accomplished without any gutting or cleaning, the fish being fastened on skewers passed through the eyes, and hung in the thick smoke at the top of sheds in which wood-fires are kept burning. They soon acquire a flavor of wood-smoke, and the smoking helps to preserve them. They are then stowed away in large frails, made from cedar-bark or rushes, in order to be used for food in winter. Immense shoals of C. approach the shores in summer, and are caught in moonlight nights, when they come to sport at the surface of the water, which may often be seen glittering with their multitudes. The Indians paddle their canoes noiselessly among them, and catch them by means of a monster comb or rake—a piece of pine-wood from six to eight feet long, made round for about two feet of its length at the place of the hand-gripe, the rest flat, thick at the back, but having a sharp edge in front, where teeth are driven into it about four inches long, and an inch apart. These teeth are usually made of bone, but the Indian fishers have learned to prefer sharp iron nails when they can get them. One Indian, sitting in the stern, paddles the canoe; another, standing with his face to the bow, holds the rake firmly in both hands, the teeth pointing sternward, sweeps it with all its force through the glittering mass, and brings it to the surface

teeth upward, usually with a fish, and sometimes with three or four, impaled on each tooth. This process is carried on with wonderful rapidity. When a sufficient quantity of C. has been dried for winter, the rest that are caught are made into oil, being, for this purpose, piled in heaps until partially decomposed, and then placed in large square pine-tree boxes; a layer about three deep in the bottom of each box, covered with cold water, and a layer of hot stones put in, then a layer of small pieces of wood, another layer of fish, stones, and so on. The oil is skimmed from the surface of the water in the boxes. A vast quantity of oil is thus obtained. The C. is an excellent article of winter-food in a climate of which the winter is severe; and notwithstanding its excessive fatness, is of agreeable flavor. It has not yet become an article of economical value to the civilized inhabitants of n.w. America, but seems likely to do so, and to acquire some commercial importance.

CAN'DLEMAS, in its Ecclesiastical Meaning: feast of the purification of the Virgin Mary, observed Feb. 2. This festival is very strictly kept by the Rom. Cath. Church, there being a procession with many lighted candles, and those required for the service of the ensuing year being also on that occasion consecrated; hence the name Candlemas day. In Scotland, this day is one of the four term-days appointed for periodical annual payments of money, interest, taxes, etc., and of entry to premises—the three other term-days there being Whitsunday, Lammas, and Martinmas: see TERM.

An old document of the time of Henry VIII., preserved in the archives of the Soc. of Antiquaries, London, concerning the rites and ceremonies in the English Church, speaks thus of the custom of carrying candles: 'On Candlemas daye it shall be declared that the bearyinge of candels is done in the memorie of Christe, the spirituall lyghte whom Simeon dyd prophecye ["a light to lighten the Gentiles"], as it is redde in the churche that daye.' But an older and heathen origin is ascribed to the practice: the Romans were in the habit of burning candles on this day to the goddess Februa, the mother of Mars; and Pope Sergius, seeing it would be useless to prohibit a practice of so long standing, turned it to Christian account by enjoining a similar offering of candles to the Virgin. The candles were supposed to have the effect of frightening the devil and all evil spirits away from the persons who carried them, or from the houses in which they were placed. An order of council in 1584 prohibited the ceremony in England. There is a tradition in most parts of Europe to the effect that a fine C. portends a severe winter. In Scotland, the prognostication is expressed in the following distich:

> 'If Candlemas is fair and clear,
> There'll be twa winters in the year.'

Christ's presentation, the holiday of St. Simeon, and, in the n. of England, the wives' feast-day, were names given

to Candlemas day. See Brand's *Popular Antiquities*, Bohn's edition.

CANDLE-NUT (*Aleurites trilobo*): tree of the nat. ord. *Euphorbiaceæ* (q.v.), native of the South Sea Islands, Madagascar, Molucca, Java, etc.; producing a heart-shaped nut with a very hard shell, and a kernel eatable when roasted, although in a raw state it has in a slight degree some of the active properties so common in the *Euphorbiaceæ*, and is apt to cause purging and colic. It is about as large as a walnut. An excellent bland oil is procured from it, used both for food and as a lamp-oil. The inhabitants of the Society Islands after slightly baking these nuts in an oven, and removing the shell, bore holes through the kernels, and string them on rushes, hanging them up in their houses, to be used for torches, which are made by inclosing four or five strings in a leaf of the screw-pine (*Pandanus*). These torches are often used in fishing by night, and burn with much brilliancy. The lampblack used in tattooing was obtained from the shell of the candle-nut. A gummy substance exudes from the candle-nut tree, which the Tahitians chew.

CANDLER, *kănd'lėr*, Warren A., American clergyman, b. Carroll County, Ga. 1857, Aug. 23. He was graduated from Emory College, Oxford, Ga., in 1875, being licensed to preach and entering the North Georgia Conference of the Methodist Episcopal Church in that year. He was in the pastorate until July, 1886, when he became editor of the Nashville *Christian Advocate* (the organ of the M. E. Church South), serving in that capacity until 1888. In the latter year he became president of Emory College, but resigned in 1898 when he became a bishop of the M. E. Church South. He has written: *History of Sunday Schools* (1880); *Georgia's Educational Work* (1893); *Christus Auctor* (1899); *High Living and High Lives* (1901); *Great Revivals and the Great Republic* (1904); etc.

CANDLISH, *kănd'lĭsh*, Robert Smith, d.d.: 1806–1873, Oct. 19; b. Edinburgh; Presb. clergyman. He entered the Univ. of Glasgow 1822, and was licensed as a preacher in connection with the Established Church 1828. In 1834 he became minister of St. George's, Edinburgh. With intense zeal, he advocated the justice and necessity of ecclesiastical reforms, and became one of the boldest and most vigorous leaders of the popular or 'non-intrusion' party. After the Disruption (see Free Church), he co-operated with Dr. Chalmers and other chiefs of the newly-formed denomination, in organizing, consolidating, and extending its aggressive efforts. In 1845–6, he was active in the establishment of the Evangelical Alliance. In 1847, he was, when Dr. Chalmers died, appointed to the chair of divinity in the New College, Edinburgh, but did not assume the functions of this office. In 1862, he was appointed principal of the same college. A Life by Wilson appeared 1880. Candlish wrote *Contributions towards the Exposition of the Book of Genesis* (1842); *The Atonement, its Reality and Extent; An*

Examination of Mr. Maurice's Theological Essays; The Fatherhood of God; Exposition of the First Epistle of St. John; Reason and Revelation (1859); *The Two Great Commandments* (1860); etc.

CANDOCK, n. *kăn'dŏk* [probably from *can* and *dock*]: a plant that grows in rivers; the yellow water-lily or *Nūphar lutĕŭm*, ord. *Nymphēācĕæ*.

CANDOLLE, Alphonse Louis Pierre Pyramus de, *ăl-fôns loo-ē pē-ār pē-râ-mu dė kân-dōl*, Swiss botanist: b. Paris, 1806, Oct. 28; d. 1893, April 4. He was son of Augustin de Candolle (q.v.). He was professor of botany and director of the Botanical Garden at Geneva, published numerous works on botanical subjects, and continued his father's *Introduction to a Natural System of the Vegetable Kingdom*.

CANDOLLE, Augustin (*ô-gûst-ăn*, Pyramus de, Swiss botanist: b. Geneva, 1718, Feb. 4; d. there 1841, Sept. 9. He studied at Paris, where he made his reputation by his *History of Succulent Plants* and *Essay on the Medicinal Properties of Plants*. In 1808 he took the chair of botany at Montpellier, where he replaced the artificial method of Linnæus by the natural method of Jussieu, and published the remarkable *Elementary Theory of Botany* After the Restoration of 1815, he returned to Geneva, where he devoted the rest of his life to his great work, *Introduction to a Natural System of the Vegetable Kingdom*, the continuation of which he entrusted to his son, together with an herbarium of 70,000 species of plants.

CANDON, *kăn-dōn'*, Philippines, a town of the province of Ilocos Sur, situated in the northwestern part of the island of Luzon, very near the coast. Pop. about 16,000.

CANDOR, n. *kăn'dėr* [L. *candor*, a dazzling whiteness —from *candĕō*, I. shine: It. *candore—lit.*, a dazzling white]: fairness; frankness; openness; sincerity; freedom from any intention to deceive.

CAN'DOUR, Mrs.: a character in Sheridan's comedy, *The School for Scandal*, the frankness of whose speech is distinguished by its acidity.

CANDROY, n. *kănd'roy:* a machine used in preparing cotton cloths for printing. It spreads out the fabric as it is rolled round the lapping roller.

CANDY, *kăn'dĭ*, or Kandy, a measure of weight in the East Indies. In Madras the candy is equal to 493.7 pounds, in Bombay it is 560 pounds, and in Ceylon it is equal to 500 pounds. It is divided into from 20 to 22 maunds. In Bombay there is a unit of capacity called the candy, equal to 8.2 imperial bushels, and elsewhere a dry-measure candy is found varying from 15 to 30 bushels.

CANDY, n *kăn'dĭ* [F. *candir*, to candy—from *candi*, candied—from It. *candi*, candy: Turk. *cand*, sugar: Ar. *gand*, sugar; *gandat*, sugar-candy]: crystallized sugar;

sugar compounded with anything else: V. to boil or dress in sugar; to cover or incrust with sugar; to form sugar into crystals. CAN'DYING, imp.: N. the act of forming into crystals, as sugar. CANDIED, pp. *kăn'dĭd:* ADJ. cooked and covered with crystallized sugar; flattering, as words having only the appearance of sweetness and fairness.

CAN'DY: see CEYLON.

CAN'DYS [Gr.]: a loose gown, worn by the Medes and Persians over their other garments. It was made of woolen cloth, either purple or of some other brilliant color, and had wide sleeves. In the sculptures at Persepolis, nearly all the personages are represented as so attired. A gown very similar is still worn by Arabians, Turks, and other orientals.

CANDY-SU'GAR: popular name of ordinary sugar when procured in large crystals by the gradual and slow cooling of a concentrated solution of sugar: see SUGAR.

CANDYTUFT, n. *kăn'dĭ-tŭft* [*candy,* and *tuft*], (*Ibéris*): genus of plants of the nat. ord. *Cruciferæ,* distinguished by unequal petals, the largest being toward the circumference of the dense corymbs in which the flowers grow, and by an emarginate pouch with the valves keeled and winged, the cells one-seeded, and the cotyledons accumbent: see COTYLEDON. The species are found chiefly in the countries surrounding the Mediterranean Sea, and the name C. is supposed to be derived from the island of Candia, the name *Iberis* from Iberia (Spain). The species *I. amara* is remarkable for bitterness. Some species are slightly shrubby; some are herbaceous perennials, some annuals. Some are among the most familiar ornaments of flower-gardens, as the annual White and Purple C. (*I. umbellata*), the Sweet-scented C. (*I. odorata*), and two slightly shrubby species, *I. sempervirens* and *I. semperflorens,* the latter of which, in favorable situations, continues to blossom through the whole winter, and is pleasing by the abundance and the perfect whiteness of its flowers.

CANE, n. *kān* [L. *canna,* a reed or cane: It. *canna:* F. *canne*]: a long, strong reed; the commercial name for the stems of various grasses, palms, etc.; a walking-stick: V. to beat or flog with a cane. CA'NING, imp.: N. a flogging with a cane. CANED, pp. *kānd.* CANY, a. *kā'nĭ,* pertaining to; abounding in canes. CANE-SUGAR: see SUGAR. CANE-TRASH, the refuse of sugar-cane used as fuel in boiling the sugar. SUGAR-CANE, the *Sac'chărŭm officinārum,* and others, ord. *Gramĭnĕæ:* the bamboo, *Bambūsa arundĭnācĕa,* ord. *Gramĭnĕæ.* RATTAN-CANES, the stems of *Calămus scĭpĭōnem,* and *rotang,* ord. *Palmæ* (see RATTAN)— and others, imported for making walking-sticks.

CANE, *kān,* or KEN, *kĕn:* river rising in Bundelcund, near lat. 23° 54′ n., long. 80° 13′ e.; after a n.n.e. course of 230 m., entering the Jumna in lat. 25° 47′ n., long. 80° 35′ e. It is too rapid and broken for navigation; and is remarkable for the matchless beauty of its pebbles.

CANEA, *kâ-nē'a*, or CANNA, *kân'nā*, called *Khania* by the Greeks: chief commercial town of Candia or Crete, and cap. of a province. It is on the n. coast, and occupies the site of the anc. Cydonia. The present city is of Venetian origin, and dates from 1252, when a colony was sent from Venice to occupy it. The object of its foundation was to keep down the Greeks, who had been in arms, and at open war with their Italian lords, almost without intermission from the day when the Venetians first set foot on their shores. Venetian coats of arms are still observed over the doorways of some of the principal houses. C. is surrounded by a strong wall and deep ditch, both much dilapidated; it has a safe but very shallow harbor. C. is the principal mart for Candian commerce, and exports, especially to France and Italy, large quantities of oil, soap, wax, and other products. Several consuls are stationed here, and it is the residence of the Turkish gov. of the province, and of the Greek bishop. The language spoken is modern Greek. The environs are very beautiful. Pop. 24,537; of which two-thirds are native Greeks, the rest mainly Turks.

CANE-BRAKE, *kān'brāk* (*Arundinaria macrosperma*): large reed or grass, indigenous to the warmer parts of the United States; of a genus allied to the bamboo. Its flowers are in panicles. It grows in marshy places.

CANE DELLA SCALA, *kâ'nā del'lâ skâ'lâ*, called the Great, and CAN GRANDE: 1291–1329, July 22; b. Verona, Italy: podesta or prince there from 1312. He took Vicenza from the Guelphs of Padua 1314, and defeated them again, 1317; became cap.gen. of the Ghibelline League 1318, and was excommunicated by the pope, 1320. After gaining many victories and taking Padua 1328, Sep. 10, he died in the cathedral of Treviso, during a triumphal entry. Sismondi calls him the ablest captain of his party in Italy, 'the best soldier, the best politician, and the person whose services and attachment the emperor most valued.' Dante, who was entertained at his palace 1314–18, celebrates C. in canto xvii. of the *Paradiso*, and addressed to him a long letter explaining the plan of the *Divina Commedia*. His tomb, by Bonino de Campione, adjoins the church of Santa Maria Antica at Verona.

CANELLA, *ka-nĕl'la* (*Canella alba*): small tree common in the West Indies, where it is often called WILD CINNAMON. Its place in the botanical system has not been exactly ascertained, but it seems allied to *Pittosporaceæ*. The fruit is a small black berry. The whole tree is very aromatic, and its flowers are extremely fragrant. The bark of the young branches is the *C. Bark* of apothecaries, known in commerce as *White-wood Bark*, and sometimes called *White Cinnamon*. It forms a considerable article of export from the Bahamas. It has an aromatic fragrance, regarded as intermediate between that of cinnamon and that of cloves, and a bitterish, acrid, pungent taste. It is employed as a stomachic and stimulant tonic, and as an aromatic addition to tonics or to purgatives, in debilitated conditions of the digestive organs.

CANEPHORI, *ka-nĕf′ō-rī:* girls annually chosen from noble families at Athens to walk in the procession at the Panathenaic and perhaps at other festivals, carrying on their heads baskets containing the apparatus needed for a sacrifice. Figures of them are shown on the frieze of the Parthenon in the British Museum, The sculptors Scopas and Polycletus copied the graceful attitudes of these girls, and this type of statue came into use in architecture to support light entablatures. The Canephori are sometimes identified or confused with Caryatides.

CANESCENT, a. *kă-nĕs′sĕnt* [L. *canes′cens* or *canescen′tem,* becoming white—from *cānus,* gray or hoary]: in *bot.,* hoary; approaching to white.

CANES VENATICI, *kā′nēz vē-năt′ĭ-sī* [L., hunting dogs]: a constellation of the n. hemisphere, added by Helvetius, and known generally as the grayhounds of Helvetius. The dogs are distinguished by the names of Asterion and Chara. On the celestial globe, they are represented as being held in leash by Bootes, and apparently pursuing Ursa Major (q.v.) round the pole of the heavens.

CANG, *kăng,* or CANQUE, or KEA: instrument of degrading punishment in China. It consists of a large wooden collar fitting close round the neck, weighing usually 50 to 60 pounds. Over the parts where the cang fastens are pasted slips of paper, on which the mandarin places his seal, so that the culprit may not be relieved until the full term of his sentence has expired, which sometimes extends to 15 days. On the cang is also inscribed, in large letters, the offense and the duration of the punishment. The criminal having been paraded through the streets by the police, is then left exposed in some thoroughfare of the city. As he is incapable of using his hands to feed himself, he has to be fed while suffering the penalty.

CANGAS DE ONIS, *kân′gâs dā o-nēs′:* town of the Asturias, Spain, about 35 m. e.s.e. of Oviedo. It is a poor place, but in its vicinity are one or two interesting monastic structures, and the cave whence the Goths fled and hid themselves, after the battle of Gaudalete, in 711, and from which, in 718, they issued, and annihilated the Moorish invaders. Pop. 7,000.

CANGIAGI, *kân-jâ′jē,* or CAMBIASO, *kâm-be-â′zo,* LUIGI: 1527–85; b. Genoa: painter. He studied under his father, and at Rome, from the works of Michael Angelo; gained high reputation at an early age, and was said to paint very rapidly, and equally well with both hands. Pope Gregory XIII. employed him, and Philip II. invited him, 1583, to Spain, to decorate the Escorial, in which he painted the *Assemblage of the Blessed* on the ceiling of the choir. His best works, after this, are the *Rape of the Sabines,* the *Martyrdom of St. George, Judith,* and a *Sleeping Cupid* at Paris. Cangiagi died at Madrid. Most of his pictures are at Genoa or in Spain.

CANGLE, v. *kăngl* [Scotch]: to quarrel, dispute. CANGLER, n.: he who.

CANICATTI, *kâ-nė-kât'tē:* town of Sicily, province of Girgenti, 15 m. e.n.e. of the city of Girgenti. It is situated on the banks of the Naro, is well built, and has sulphur mines. The people are principally engaged in agricultural pursuits. Pop. about 25,000.

CANICULAR, a. *kă-nĭk'ū-lėr* [L. *canic'ŭla*, a little dog—from *cŏnis*, a dog]: belonging to the dog-star. Canicular was an old name of Canis Minor (q.v.); it was also used to denote Sirius, or the dog-star, the largest (to the eye) and brightest of all the stars, and which is situated in the mouth of Canis Major (q.v.). From the Heliacal rising (q.v.) of this star (Sirius), the ancients reckoned their dog-days, or *Dies Caniculares*, 40 in number—20 before, and 20 after the rising of the star. The rising of the dog-star was in ignorance supposed to be the occasion of the extreme heat and the diseases incidental. It was by mere accident that the rising of the star coincided with the hottest season of the year, in the times and countries of the old astronomers. The time of its rising depends on the latitude of the place, and is later and later every year in all latitudes, owing to precession. In time the star will rise in the dead of winter. The Canicular year was that known among the Egyptians and Ethiopians, computed from one rising of Sirius to the next, and consisting ordinarily of 365 days, and every fourth year of 366. This year was sometimes called the Heliacal year. The reason for computing the year from the rising of Sirius seems to have been that, at the time, the heliacal rising coincided with the greatest swelling of the Nile.

CANIDÆ, *kăn'ĭ-dē* [L. *canis*, a dog]: family of the Digitigrade (q.v.) section of carnivorous mammalia, which, as now generally defined, is less extensive than the Linnæan genus *Canis*, the hyenas being excluded from it, and referred to the family *Viverridæ* (civets, ichneumons, etc.). These families are, indeed, closely connected, and hyenas may be said to form a connecting link between them, the dentition, however, making a nearer approach than in either of them to that of the cats or *Felidæ*.—The C. have two flat tuberculous molar teeth or grinders on each side, behind the great carnivorous cheek-tooth—the last premolar—of the upper jaw, a dentition resembling that of the bear family, or *Ursidæ*, which they resemble further in their power of adapting themselves to vegetable food. Their whole organization fits them to be less exclusively carnivorous than the feline tribe. They have generally three incisors or cutting teeth, with one large canine tooth and four premolars on each side in each jaw, two true molars on each side in the upper jaw, and three in the lower. The true molars are adapted for crushing either bones or vegetable food. The last premolars in the upper jaw are remarkably large, and particularly adapted for cutting flesh. See Dog: Fennec: Fox: Jackal: Lycaon: Wolf: etc.

CANINE, a. *kă-nīn'* [L. *canīnus*, canine—from *canis*, a

dog.: It. *cane*]: of or pertaining to a dog: having the qualities of a dog. CANINE MADNESS, the madness of a dog; hydrophobia. CANINE TEETH, two sharp-pointed teeth in each jaw, one on each side—often simply termed CANINES, n. plu. *kă-nīnz'*.

CANISIUS, *kâ-nē'se-us* PETRUS: 1521, May 8—1597, Dec. 21; b. Nimeguen: Dutch Jesuit. His name De Hondt (dog) he turned into Latin. He was the first man in Germany to enter the Society of Jesus, became its provincial, and established colleges at Augsburg, Dillingen, Prague, and Freiburg. He was active in the Council of Trent 1545, preached before Ferdinand I., and urged that emperor to extreme measures against the Protestants. He became rector and vice-chancellor of the Univ. of Ingolstadt 1549, and prof. of theology. His *Institutiones Christianæ Pietatis* (1566) has been reprinted more than 100 times, and translated into many languages; his *Summa Doctrinæ Christianæ* was also much used. He died at Freiburg, Switzerland.

CANIS MAJOR, *kā'nĭs mā'jor*, the *Greater Dog:* constellation of the s. hemisphere, below the feet of Orion. It contains Sirius, brightest of all the stars, and its place may be found by means of this star, which is on the continuation of the line through the belt of Orion. According to Flamsteed, this constellation contains 31 stars.

CANIS MI'NOR, the *Lesser Dog:* constellation of the n. hemisphere; near Canis Major, and just below Gemini. Procyon, of the first magnitude, is its principal star, and is in a direct line between Sirius and Pollux; so that the position of the constellation may be found by means of this star. According to Flamsteed it contains 14 stars.

CANISTER, n. *kăn'ĭs-tėr* [L. *canis'trum*, a basket woven from reeds: It. *canestro*]: a box or case for tea, coffee, etc.; in *mil.*, a tin canister having a wooden bottom, packed with balls, and shot from a cannon—called also CASE-SHOT (q.v.).

CANJIAR, n. *kan'jĭ-ar*: a poniard.

CANKER, n. *kăng'kėr* [L. *cancer;* C. *chancre*, an eating sore (see CANCER)]: a disease in trees which causes the bark to rot and fall off; a corroding ulcer; anything which corrodes or destroys; vaguely applied to various diseases of the lower animals, characterized by their chronic nature, and consisting chiefly in ulceration, suppuration, and the development of fungoid excrescences: V. to eat; to corrode; to consume, as a cancer does the body; to grow corrupt; to waste away by degrees. CAN'KERING, imp. CAN'KERED, pp. *-kėrd*, in *OE.*, corroded, rusted, as a metal. CAN'KERISH, a. CAN'KEROUS, a. *-ŭs*, corroding like a canker. CANKER-LIKE, a. CANKER-BIT, a. bitten by an animal with ulcerous teeth. CANKER-FLY, a fly that lives on fruit. CANKER, or CANKER-WORM, n. a worm very destructive to plants, and the leaves and fruit of trees; the caterpillar. CANKER, n. miner's provincial term for the ochrey matter

deposited by ferruginous springs, the water being spoken of as canker-water; in *OE.*, CANKER is a name popularly applied to various wild flowers in the sense of 'wild or worthless'—as, the canker-rose or red field-poppy, the dog-rose, a toadstool, etc.

CAN'KER: disease of plants, especially fatal to fruit-trees. It is a kind of gangrene, usually beginning in the young shoots and branches, and gradually proceeding toward the trunk, killing the tree in a few years. Wet subsoils seem in many cases to induce it, and it begins most readily in shoots imperfectly ripened and injured by frost, or accidentally wounded. Those varieties of fruit-trees long propagated by grafting and budding are most liable to it. It is sometimes cured by *heading down* the tree, and causing it to throw out new branches.

CAN'KER: disease in the foot of the horse; believed by Gerlach of Berlin to be truly cancerous. It is observed in two different forms: acute, when the malady is chiefly local; and chronic, when the constitution suffers, and all local remedies fail to restore a healthy function of the structures of the foot.

Symptoms.—It usually commences by discharge from the heels, or the cleft of the frog of the horse's foot. The horn becomes soft and disintegrated, the vascular structures beneath become inflamed, and the pain is intolerable. The animal is therefore very lame on one, two, or all feet, according to the number affected. Though there is no constitutional fever, the horse becomes emaciated, and unfit for work. During wet weather, and on damp soil, the symptoms increase in severity. The sore structures bleed on the least touch, and considerable fungoid granulations, commonly called proud flesh, form rapidly.

Causes.—This disease is occasionally hereditary, and it is most frequently seen in low-bred draught or coach horses. Dirt, cold, and wet, favor the production of the disease, and there is always a tendency to relapse when once an animal has been affected.

Treatment.—Pare away detached portions of horn, and, in mild cases, sprinkle powdered acetate of copper over the sore; apply over this pledgets of tow, fixed over the foot by strips of iron or wood passed between shoe and foot. In severe cases, tar and nitric acid, creosote and turpentine, chloride of zinc paste, and other active caustics, have to be used for a time with the regular employment of pressure on the diseased surface. The animal requires to be treated constitutionally by periodical purgatives and alteratives. Good food, fresh air, and exercise often aid in the treatment.

CAN'KER: disease in the mouth, usually of children. It is an ulceration of the mucous membrane, and may result from indigestion. Overindulgence in candy or other forms of sweets is a not uncommon cause of the ulceration, especially in adults. It usually disappears in a few days without treatment; when more obstinate, it may be treated

with borate of soda or a mouth wash of chlorate of potash solution. Physicians sometimes apply nitrate of silver.

CANKER-WORM (*Anisopteryx*): genus of the order *Lepidoptera*, family *Phalænites* or *Geometræ*, and group *Hyberniadæ*. The moths which produce these worms come out of the ground usually in March. The female is wingless, creeps up a tree, and deposits a cluster of 60 to 100 eggs, attached to a branch by a waterproof glue or varnish. These are hatched early in May: the larvæ feed on the leaves of apple, elm, and other trees. After a month, having attained a length of nearly an inch, they descend, mostly by threads, burrow in the earth, and change to light brown chrysalids within 24 hours, emerging as moths at night in the following autumn or spring. The male has four wings, which when expanded measure $1\frac{1}{4}$ in. This caterpillar has ten legs, but moves by arching the back, bringing forward its rear part, and stretching out to its full length; hence they are called span-worms, inch-worms, or loopers. They may sometimes be dislodged from the trees by shaking the branches, or destroyed by dusting with air-slacked lime when wet, or showering with whale-oil and water. The laying of their eggs may be prevented by applying tar or oil to the trunks. Birds, beetles, and wasps prey upon the worms, and certain small flies pierce the eggs. English sparrows were imported largely with a view to deliverance from this pest. They are described in Harris's *Insects Injurious to Vegetation*, 1862. The American species (*A. vernata*) is somewhat smaller than the European, and has darker wings.

CAN'NA: one of the Islands of the Hebrides, off the w. coast of Scotland, 7 m. s.w. of Skye, and 3 m. n.w. of Rum, belonging to Argyleshire. Canna is $4\frac{1}{2}$ m. long from e. to w., and 1 m. broad. The surface stands high above the sea, and consists of trap (claystone, porphyry, and trap conglomerate, with fragments of old red sandstone and bituminous wood), which has overflowed thin laminæ of coal and shale. The island has a hill of basalt, called Compass Hill, which reverses the magnetic needle. Pop. 119.

CANNA, *kăn'na:* plant of the order *Marantaceæ*, valued for lawns, as growing to a height of 3 to 8 ft., with leaves sometimes 2 ft. long. At least 8 varieties are now cultivated. The seeds, hard and black, of *C. Indica* are called Indian shot. *C. coccinea*, in the W. Indies, yields a starch known as *tous-les-mois*, used in place of arrowroot. The smallest species, *C. flaccida*, grows in the south near the coast, and has yellow flowers.

CANNABINACEÆ, *kăn-na-bĭn-ā'sē-ē:* nat. ord. of dicotyledonous plants, or, according to many, a sub-order of *Urticaceæ* (q.v.), differing from the proper *Urticaceæ*, chiefly in the suspended exalbuminous seed, and hooked or spiral embryo. Only two plants of the order or sub-order are known, both valuable, HEMP (q.v.). and the HOP (q.v.). See also HASHISH.

CANNABINE, n. *kăn′ă-bīn,* or CAN′NABIN, n. *-bĭn,* or CANNABENE, *-bēn* [L. *cannăbis,* hemp]: a hydrocarbon or volatile oil distilled from the Indian hemp, having a powerful intoxicating action. CANNABIS INDICA, *kăn′ă-bĭs ĭn′dĭ-kă,* Indian hemp (see HEMP; HASHISH). C. SATIVA, *săt-ī′vă* [L. *satīvus,* fit to be planted]: common hemp.

CANNE, *kân′nā* (anc. *Cannæ*): town of s. Italy, province of Bari, 8 m. w.s.w. of Barletta, not far from the mouth of the Ofanto, formerly the Aufidus. It is noted for the great victory of Hannibal over the Romans in the summer of B.C. 216. Hannibal crossed the Aufidus at a ford, and attacked the Romans, who, in a short time were almost annihilated by the terrible Numidian cavalry. Among those left dead on the field were Paulus Æmilius, the consul of the previous year; Minucius, the late master of the horse, and a vast number of Roman knights. The loss of the Romans is stated by Livy at 45,000 infantry and 3,000 cavalry. As Hannibal lost in the battle 8,000 men, he did not think it prudent to follow the advice of Maharbal, and advance rapidly on Rome. Twenty thousand Romans were made prisoners, partly on the field of battle, partly in camp.

CANNEL-COAL, n. *kăn′nĕl-kōl* [a corruption of *candle-coal* or *kindle-coal,* so named from its easy ignition and giving out much flame: Norw. *kynnel,* a torch]: a hard, black, inflammable coal, known to the Scotch miners as *parrot-coal*—much used for the manufacture of gas: see COAL.

CANNELURES, n. plu. *kăn′nĕl-ūrz* [F. *cannelure,* a channel, a fluting—from L. *canna,* a reed]: small groovings; longitudinal groovings on a pillar.

CANNES, *kânn:* seaport town of France, dept. of Alpes-Maritimes, pleasantly situated on the Mediterranean, on the road to Nice. It is famed for salubrity as a winter residence. Lord Brougham used to occupy a fine villa here. Latterly, the town has been much improved. It has fisheries of anchovies and sardines, and a trade in the produce of the district. Bonaparte, after his escape from Elba, landed about a mile and a half e. of C., 1815, Mar. 1. Pop. (1901) 30,420.

CANNIBAL, n. *kăn′nĭ-băl* [Sp. *cannibal,* a cannibal—from the *Caribs* or *Caribales,* original inhabitants of W. India Islands, who were reputed man-eaters, and some tribes of whom, having no *r* in their language, pronounced their name *canib*]: a savage that eats human flesh; an anthropophagite. CAN′NIBALLY, ad. *-lĭ.* CAN′NIBALISM, n. *-ĭzm.* The practice of cannibalism is often attributed by classical and early Christian writers to races whose practices they denounce as abominable; but the denunciation is often better evidence of the abhorrence of cannibalism by the denouncers than of its practice by the denounced. Homer describes Polyphemus as eating men, but only as one of his many unnatural attributes as a monster. The early Christian writers frequently attributed cannibalism to the

unconverted Pagans. St. Jerome gives his personal testimony to the practice, stating that when he was a little boy living in Gaul, he beheld the Scots—a people of Britain—eating human flesh; and though there were plenty of cattle and sheep at their disposal, yet would they prefer a ham of the herdsman or a piece of female breast as a luxury. Statements in old authors still more absurd induced some thinkers to take the position that cannibalism is unnatural, and to deny that it was ever practiced by human beings except under pressure of starvation. The accurate observation of late travellers has, however, put it beyond doubt that cannibalism has been and is systematically practiced. Comte, as part of his system of positive philosophy, accepting of cannibalism as a condition of barbarism, maintains that the greatest step in human civilization was the invention of slavery, since it put an end to the victor eating the vanquished. The facts, however, which we possess, show that the people systematically addicted to human flesh are not the most degraded of the human race. For instance, in the Australian continent, where the larger animals are scarce, the people, who are of an extremely degraded type, feed on worms and herbs, and have been known only in casual and exceptional conditions to feed on human flesh. The New Zealanders, on the other hand, the most highly developed aboriginal race with which late European civilization has had to compete, were, till recently, systematic feeders on human flesh, despising the inefficient food which satisfied the natives of Australia. In Angas's *New Zealand Illustrated*, there is a picture of the country mansion of the accomplished chief Rangihaeta, a fine specimen of elaborately ornamented, dwellings in that land. Its name is Kai Tangata, which means, eat man; so called in pleasing memorial of the feasts held within its walls. It. has been supposed that the reason why, among the Jews and several eastern nations, the eating of swine's flesh was forbidden as an unclean food, was its resemblance to human flesh, and the danger that persons accustomed to the one might not retain their abhorrence of the other. In the Crusades, the Saracens charged their Christian enemies with eating unclean food, including flesh of men and of swine. In the old romance of Richard Cœur de Lion, he is represented, on recovering from sickness, as longing for a piece of pork; but that not being procurable, a piece of a Saracen's head was substituted for it, and pronounced by him to be infinitely more palatable. There have been many dreadful instances where people who naturally had a horror of such food, have been driven by starvation to eat human flesh—as in sieges and shipwrecks. Besides these instances, however, and the systematic cannibals, there is no doubt that people not otherwise habituated to the practice, have been excited by ferocity and revenge to eat, and with relish, the flesh of enemies. In many of the cannibal countries, the flesh of enemies only is consumed. As

an instance that this is a natural development of ferocity in degraded natures, we may take the fate of the Princess Lamballe in the French Revolution, whose heart was plucked out by one of the savages of the mob, taken to a restaurant, and there cooked and eaten by him. The great highland chief, Sir Ewen Cameron of Locheil, in a death-struggle with an English trooper, killed him by biting a piece out of his throat, and used to say it was the sweetest morsel he had ever tasted.

CANIFF, *kăn'ĭf*, WILLIAM, Canadian physician: b. Thurlow, near Belleville, Ontario, 1830. He was educated at Victoria College, Cobourg, and studied medicine in Toronto, New York, and London, England, where he took the degree of M.R.C.S. He served in the Crimean war, 1856; returned to Canada, became professor of surgery in Victoria College; visited the Washington hospitals during the Civil War, and finally settled in the practice of his profession at Toronto. He was one of the originators of the 'Canada First' movement. Besides many periodical articles, he has written *Manual of the Principles of Surgery, Based on Pathology* (1866); *The Medical Profession in Upper Canada*, 1783–1850; *An Historical Narrative* (1894); *The Settlement of Upper Canada.*

CANNILY, a. *kăn'ĭ-lĭ* [Scot., see CANNY]: cunningly, shrewdly.

CANNING, *kăn'ĭng*, ALBERT STRATFORD GEORGE, English writer: b. 1832, Aug. 24. He is the second son of the first Baron Garvagh. He has been a prolific writer, and among his works may be mentioned *Christian Toleration* (1874); *Intolerance Among Christians* (1876); *Religious Strife in British History* (1878); *British Rule and Modern Politics* (1898); *British Power and Thought* (1901); *Political Progress of Christianity* (1877); *Philosophy of the Waverly Novels* (1879); *Philosophy of Charles Dickens* (1880); *Baldearg O'Donnell* (1881); *Macaulay, Essayist and Historian* (1882); *Thoughts on Shakespeare's Historical Plays* (1884); *Revolted Ireland* (1886); *The Divided Irish* (1888); *Literary Influence in British History* (1891); *Words on Existing Religions* (1893); *Religious Development* (1896); *History in Fact and Fiction* (1897); *Shakespeare Studied in Eight Plays* (1903); *History in Scott's Novels* (1905); etc.

CANNING, CHARLES JOHN, Earl and Viscount: 1812, Dec. 14—1862, June 17; second son and youngest child of George Canning. Educated at Eton and Oxford he succeeded to the peerage as Viscount Canning on his mother's death, 1837, his elder brother, who was a captain in the navy, having been drowned at Madeira 1828. In 1841, he became under-sec. of state for foreign affairs in Sir Robert Peel's government, and afterward commissioner of woods and forests. When Lord Aberdeen came into office he was made postmaster-general; and in the beginning of 1856 he succeeded Lord Dalhousie as gov.gen. of India. His conduct during the awful crisis of the Indian mutiny was decried at the time by some critics as weak;

but when all the circumstances of the case became known, the almost universal verdict was that Canning had acted with singular courage, moderation, and judiciousness. He died in London. See CUNNINGHAM, *Earl Canning* (1891).

CANNING, GEORGE: 1770, Apr. 11—1827, Aug. 8; b. London: British statesman and orator. His father, who was of an ancient family, incurred the displeasure of his relatives for marrying beneath his station, and died in poverty when his son was only a year old. His mother (who for a subsistence tried the stage, with little success, married an actor, and subsequently a linen-draper) lived to rejoice in the success and participate in the good-fortune of her boy, whose education was liberally provided by an uncle. Canning was first educated at Eton, from which he passed, at the age of 17, to Christ's Church College, Oxford, where he greatly distinguished himself, especially in classics. While here, he cultivated the friendship of the Hon. Charles Jenkinson (afterward Lord Liverpool), who was of considerable service to him in after life. From Oxford he went to Lincoln's Inn, but on the suggestion of Burke, it is said, he soon relinquished the bar for a parliamentary career. He entered the house for Newport, Isle of Wight, 1793, as the protégé and supporter of the minister, Pitt. In 1796, he was appointed an under-sec. of state. It was not, however, until 1798 that Canning made a reputation as an orator and a statesman, by his speeches in favor of the abolition of the slave-trade, and against Mr. Tierney's motion regarding peace with the French directory, the latter speech, especially, being regarded as a master-piece of eloquence, alike by the house and by the country. In the debates on the Habeas Corpus Suspension Act, the union with Ireland, and other important questions, C. gave valuable assistance to the ministry, not only by his voice in parliament, but by his pen in a satirical paper, called the *Anti-Jacobin*, in which he especially lashed the 'New Philosophy,' as it was called, promulgated by the French republicans. *The Knife Grinder* is one of the best known and happiest of his efforts in this line. In 1801, Pitt resigned office and Canning joined the opposition against the Addington ministry. When Pitt again became premier, 1804, Canning was made treasurer of the navy, an office which he held until Pitt's death 1806. His opposition to the short-lived Grenville ministry which succeeded, savored of the bitterness of party feeling, and his treatment of Fox in his last days, and of his memory after his death, was far from generous. When the Portland ministry was formed in 1807, Canning was appointed minister for foreign affairs, a position for which he was specially qualified, and his dispatches, written at this time, are models of manliness and lucidity. In 1812, all his eloquence was enlisted in favor of Rom. Cath. emancipation. During the same year he was elected for Liverpool, for which he was again returned three successive times. In 1814, he went as ambassador to Lisbon, returned in 1816, and was made pres. of the board

of control, and supported the Liverpool ministry in all their arbitrary aad repressive measures until 1820, when he resigned, in consequence of the action of the government against Queen Caroline. Nominated gov.-gen. of India 1822, he was on the eve of departure when the suicide of the Marquis of Londonderry called him to the head of foreign affairs. In this capacity Canning conferred lasting benefits on his country. He infused a more liberal spirit into the cabinet; he asserted the independence of British politics against the diplomacy that would have entangled the nation with the Holy Alliance, and gave a new direction and impetus to commercial affairs by a gradual laying aside of the prohibitive system. He arranged the relations of Brazil and Portugal; drew the French cabinet into agreement with the British respecting Spanish American affairs; was the first to recognize the free states of Spanish America; promoted the treaty combining England, France, and Russia, for a settlement of the affairs of Greece, which was signed 1827, July 6; protected Portugal from Spanish invasion; contended earnestly for Rom. Cath. emancipation; and prepared the way for a repeal of the Corn-laws. In 1827, Feb., a stroke of paralysis forced the Earl of Liverpool to resign, and Canning was called to form a new administration. His health, however, gave way under the cares of his office, which he found beset with unexpected difficulties and bitter opposition; and he died in the same year. His remains were interred in Westminster Abbey, near those of Pitt. As a parliamentary orator, C. holds a distinguished place in British annals. His acuteness of mind, power of expression, and well-pointed wit, were remarkable; but on the whole as an orator he was inferior to Pitt, Burke, and Fox. He lacked the imposing characteristics of the first, the overpowering enthusiasm of the second, and the winning address of the last. As an administrator he had surpassing ability. He was intensely British, and his foreign policy was of the character best calculated to promote British interests.

In 1800, Canning married Miss Joan Scott, who had a great estate and was connected with some of the highest families in the kingdom.

Canning's speeches have been reprinted in 6 vols. 8vo, by Therry; and several memoirs, including one by his private secretary, Mr. Stapleton, have been published.

Consult Stapleton, *Political Life of Canning* (1831); Stapleton, *Canning and His Times* (1835); Lord Dalling, *Historical Characters* (1867).

CANNING, Sir Samuel, English civil engineer: b. Wiltshire, 1823. He is best known in connection with the laying of the Atlantic cables in 1865-6 and 1869, and those in the Mediterranean and North Seas. He was knighted in 1866.

CANNING, Sir Stratford: see Stratford de Redcliffe, Viscount.

CANNIZZARO, Stanislao, *stân-ĭs-lâ'ō kân-nē-tsâ'rô:*

Italian chemist; b. Palermo, 1820, July 16. He studied medicine at Palermo, and chemistry at Pisa. In 1848 he was a member of the Sicilian Parliament and had part in the revolution in Sicily. In 1852 he became professor of chemistry in Alessandria; in 1857 in Genoa; in 1860 in Palermo; and in 1870 in Rome. He emphasized by clear definition the difference between atomic and molecular wéights, and was one of the most influential in establishing Avogadro's law as a maxim of chemical science. He also discovered benzyl-alcohol and cyanamide. He wrote *Sunto di un Corso di Filisofia Chemica, e Nota Sulle Condensazioni di Vapore* (1880); *Relazione Sulle Analsii di Alcune acque Potabili* (1882); and *Abriss eines Lehrganges der theoretischen Chemie* which appeared in Ostwald's *Klassiker der exakten Wissenschaften.*

CAN'NOCK, England, a town in West Staffordshire, seven and one half miles northwest of Walsall, in the district known as Cannock Chase, which is rich in coal and ironstone. Manufactures of boilers, edge-tools, bricks, and tiles, are carried on, and there are numerous collieries. Pop. (1901) 23,992.

CANNON, *kăn'nŏn,* Frank Jenne, American politician, son of George Q. Cannon (q.v.): b. Salt Lake City, Utah, 1859, Jan. 25. He was graduated from the University of Utah in 1878, and has since been engaged in journalism. He was United States senator, 1896–9, and has been prominent as a Silver Republican.

CANNON, George Lyman, American geologist: b. New York, 1860, March 10. He was educated at the University of Colorado and the Colorado State School of Mines, and has been an instructor in geology and biology in the Denver High School from 1887. He has published *Geology of Denver and Vicinity* (1894); *Outlines of Geology* (1895); *Nature Study for Denver Schools* (1895); *The Protection of Colorado Birds* (1899); *Colorado Science Literature* (1902); etc.

CANNON, George Q., American politician: b. Liverpool, England, 1827, Jan. 11; d. Monterey, Cal., 1901, April. 12. He went with his parents to Nauvoo, Ill., in 1844, and was one of the earliest settlers in Salt Lake City. He was a member of the Legislative Council of Utah in 1865–6 and 1869–72, and was a delegate to Congress from 1865 to 1881. At a Constitutional Convention at Salt Lake City in 1872 he was chosen to present the constitution and memorial to Congress for the admission of the Territory into the Union as a State. He translated the *Book of Mormon* into the Hawaiian language. His son, Frank J. Cannon, was elected one of the first two United States senators from Utah in 1896.

CANNON, Henry White, American bank president: b. Delhi, N. Y., 1850, Sept. 25. He was educated at Delaware Academy in his native town and engaged in banking. He was comptroller of the currency, 1884–5, and was a member of the International Monetary Confer-

ence at Brussels in 1892. He is a director of several important railroads and of the Manhattan Trust Company, and president of the Chase National Bank in New York.

CANNON, Joseph G., American politician: b. Guilford, N. C., 1836, May 7. Admitted to the Illinois bar, he was State's attorney of Vermillion County, 1861–8. He was a member of Congress from 1873 to 1891, and again, 1893–1903 from the 12th Illinois district and from the 18th district since 1903. He was 20 years on the Committee on appropriations, and its chairman in the 55th, 56th, and 57th congresses. Since 1903 he has been speaker of the House of Representatives. He is rugged and unconventional in manner and a ready and fearless debater.

CANNON, n. *kăn'nŏn* [F. *canon*, a gun—from *canne*, a reed—from L. *canna*, a reed-pipe. It. *cannone*, a cannon—from *canna*, a reed, a tube]: a great gun. Cannon-ball, ball for shooting from a cannon. Cannon-proof, a state of safety from cannon-shot; hence, generally, safety: Adj., proof against the attacks of cannon. Cannon-shot, the distance to which a ball can be projected from a cannon. Can'nonade, n. *-ād* [F.—from *canon*]: the act of throwing balls from cannon: V. to attack with cannon; to batter with balls or shot. Can'nona'ding, imp. Can'nona'ded, pp. Can'noneer' or Can'nonier', n. *-nō-nēr'*, the man who manages a cannon. *Note.*—Cannon originally meant the 'stock of the arbalist,' then 'the gun-barrel,' and finally 'a piece of ordnance.'

CANNON, v. *kăn'nŏn* [unascertained: may be a simple adaptation from preceding entry]: to hit a ball so as to cause the striker's ball to rebound on to the third—a term in billiard-playing. Cannon, n. a stroke thus played. Can'noning, imp. Cannoned, pp. *kăn'nŏnd*, said of a moving body whose direct course has been arrested and deflected by some resistance. See Carom.

CANNON· a general name for large guns or ordnance as distinguished from those weapons fired from the hand, or small arms. Cannon are supported on carriages, pedestals, or other mounts. Formerly they were cast or founded of iron, brass or bronze. Modern cannon are made of steel and are 'built up' in order to resist the great strain of modern powders. See Gun Manufacture and Ordnance.

CAN'NON-BALL TREE (*Couroupita Guianensis*): tree of the nat. ord. *Lecythidaceæ*, native of Guiana, of great size, the trunk being often more than two ft. in diameter. It has large ovate-oblong leaves; the flowers are produced in racemes; they are white and rose-colored; and the fruit is large, 'about the size of a 36-pound shot,' nearly round. The hard woody shell of this fruit is used for drinking-vessels

CANNON-BONE: see under Canon 2.

CANNON-FOUNDING: the making of heavy guns or ordnance by casting or founding. Cannon-Founding is practically obsolete, as metals when cast, although of

the finest steel, do not possess sufficient strength to resist the pressures of modern powders necessary to produce sufficient velocities for projectiles fired from them. Certain classes of small cannon or ordnance are still cast in Norway and Sweden, but the industry, in a military point, is no longer of importance. See GUN MANUFACTURE.

CANNOT, v. and ad. *kăn'nŏt* [*can*, and *not*]: to be unable.

CANNSTADT, or KANNSTADT, *kân'stât:* town of Würtemberg, beautifully situated on the Neckar, about 3 m. n. e. of Stuttgart. It owes its origin to the Romans, of whose presence there are still many traces. Until the 15th c. it was the cap. of Würtemberg. The Wilhelm palace, finished 1851, is notable as a specimen of the elaborate Saracenic style. C. has numerous mineral springs, discharging 800,000 cubic ft. of water in the 24 hours, which are much frequented during the season; manufactures of woolens, cottons, tobacco, etc.; and a large trade by means of the Neckar. C. is now one of the most thriving towns in Germany. Pop. 26,500.

CANNY, a. *kăn'nĭ* [Scot.: Icel. *kenna*, to perceive by sense]: gentle; cautious and obliging; harmless; nice; safe. NOT CANNY, or UNCANNY, dangerous; not safe.

CANO, *kâ'no*, ALONSO: 1601, March—1664 (or 67); b. Granada: illustrious Spanish painter, founder of the School of Granada. He received his first instructions in the principles of art from his father, Miguel Cano, an architect; studied sculpture under J. Montanes, and painting under Pacheco and Juan de Castillo; and attained celebrity so early that in 1638 or 1639 he was appointed court painter and architect to the king. Cano was of a hasty temper, and was accused of having murdered his wife in a fit of violent jealousy, but the accusation appears to have been quite groundless. He was, however, subjected to the torture—the judges sparing his right arm for the sake of his skill in art; but no confession having been elicited he was acquitted and received again into the royal favor, named residentiary of Granada, and spent his last years in acts of devotion and charity. He died at Granada. In the opinion of Fuseli he excelled all his contemporaries except Velasquez. His eminence in the three departments of the fine arts—sculpture, painting, and architecture—obtained for him the hyperbolical honor of being called the *Michael Angelo* of Spain. His pictures, marked by graceful design and pleasing coloring, are very numerous and are preserved in Granada, Seville, Madrid, Malaga, and other Spanish cities.

CANOE, n. *kă-nô'* [of American Indian origin; said to have been borrowed by the Spanish (*canoa*) from the native Indian name of such boats; a similar name exists in the Aryan languages: Ger. *kahn*, a boat; O. Fr. *cane*, a ship, and *canot*, a boat. The root of these words is the same as that of *cane* (L. *canna*), a reed or hollow stem, and signifies hollowness, capacity; Gr. *chaino*, to gape or *yawn*. From the same root come *cann*, a drinking-cup;

cannon (It. *cannone*, properly a large tube, being an augmentative from *canna*, a hollow stem or tube); *canon* (Ger.), a ruler or straight rod, most readily obtained from a joint of a reed; *canal* (Lat. *canalis*, a pipe or conduit)]: boat made by hollowing and shaping the trunk of a tree; a boat made of skin, or the bark of trees; a small river-boat propelled by a paddle. Canoes have been made large enough to carry twenty or thirty hogsheads of sugar. Some have decks, and carry sail of rush or silk-grass; but they are generally open boats, rowed by paddles, and steered by an oar. They are seldom wide enough for two men to sit abreast, but vary greatly in length. Near sea-coasts, canoes are often made of light wooden frames, covered with seal-skins, which are also drawn across as a deck, with only a hole left for one man to sit in. In the Hudson's Bay Territories, and some other parts of N. America, canoes are light enough to be carried over the *portages*, where river navigation is interrupted by shallows or by short spaces of intervening land. Canoes hollowed out of the trunks of oaks seem to have been in use among the early inhabitants of the British Islands. They have been dug up in considerable numbers in England, Scotland, and Ireland. They appear to have been chiefly of two sorts—one about 10 ft. long, with square ends, and projecting handles; the other, about 20 ft. long, sometimes sharp at both ends, sometimes round at the prow and square at the stern.

CANON, n. *kăn'ŏn* [Gr. *kanōn*, a measuring or marking pole, a ruler—from *kanna*, a cane (see CANOE): L. *canon*, a rule, *canonĭcŭs*, regular]: a tried or authorized roll; in *arts* and *sciences*, a rule or standard: in *church affairs*, a rule or law in discipline or doctrine; a decision or decree determined by a church or by a universal council of the church, and invested with authority (see CANON LAW); a rule in general, a catalogue or calendar of saints; specifically, collective name for the books of the Holy Scriptures, called the *sacred canon*, accepted by Christians as the rule of faith and life (see BIBLE) ; a dignitary of the church; in printery, a size of type equal to a 4-line pica; a piece of music in which the first part is taken up and imitated by the other parts; every last step in an equation; anc. name for the prayers recited by Cath. priests before, at, and after the consecration of the Host (see CANON OF THE MASS); the catalogue of Rom. Cath. saints. CANON LAW, the body of ecclesiastical law enacted by the Rom. Cath. church or the law governing any diocese, province, or national Church enacted by the Church. CANONESS, n. a woman who enjoys an income attached to a church, but who has no ecclesiastical duty to perform; canonesses in the Rom. Cath. Church were usually members of certain orders, lived in common, and busied themselves in educational work. CANONIC, a. *kă-nŏn'ĭk*, or CANON'ICAL, a. *-ĭ-kăl*, according to the rules or laws of the church. CANON'ICALLY, ad. *-lĭ*. CANON'ICALS, n. plu. *-ĭ-kălz*, the ecclesiastical dress of

a clergyman in some churches, while officiating (see VESTMENTS). CANON'ICATE, n. the office of a canon. CAN'ONIST, n. a man versed in ecclesiastical law. CAN'ONIS'TIC, a. pertaining to the canon law. CAN'ONIC'ITY, n. *-ĭs'ĭ-tĭ*, agreement with the canon of Scripture, or comprehension within it. CANONIZE, v. *kăn'ŏn-īz*, in the *R. Cath. Chh.*, to declare a man or woman a saint, and to inscribe his or her name in the catalogue of saints' names; also, to appoint to a canonry. CAN'ONI'ZING, imp. CAN'ONIZED, pp. *-īzd*. CAN'ONIZA'TION, n. *-ī zā'shŭn*, the act of declaring any person a saint. CAN'ONSHIP, n. the benefice filled by a canon; also CAN'ONRY, n. *-rĭ* (see CATHEDRAL). CANON OF THE MASS, the part of the mass beginning after the Sanctus and ending with the last blessing, the central parts of which form the sacred words of consecration of the elements. CANONICAL HOURS, in the *Rom. Cath. Chh.*, particular parts of the day and night set apart for prayer, being seven in number, and named respectively, *matins*, *prime*, *tierce*, *sext*, *nones*, *vespers*, *compline* or *completorium*, as recited in the Roman Breviary; in the *Eng. Chh.*, the legal hours for marriage ceremony, 8 A.M. to 12 noon and in religious houses and conventual and monastic bodies the hours above named are somewhat observed. CANONICAL SCRIPTURES, also CANONICAL EPISTLES, those books of Scripture admitted to be of divine origin, as distinguished from apocryphal books.

CANON, or CANNON-BONE, n. *kăn'ŏn* [L. *canna*, a reedpipe (see CANNON 1)]: one of the long bones in the fore or hind legs of the horse from the hough to the hoof, so named from their tube-like shape; large-sized printing-types—perhaps so named from the tube-like appearance of some parts.

CAÑON, or CANYON, n. *kăn'yŏn* [Sp. *cañon*, the tube or pipe, a cannon: L. *canna*, a reed-pipe]: in *western America*, a deep gorge or ravine between high and steep banks. Of the many cañons the greatest is the Grand Cañon of the Colorado, an awful gorge through which the river flows. Its walls are from 3,000 to 7,000 ft. high, often nearly perpendicular; its length more than 300 miles.

CANON, *kăn'ŭn:* ecclesiastical dignitary, so called as living under a rule, or as following the rule or canon of divine service. His office is of no great antiquity. According to Paschier, the name was not known before Charlemagne. This, however, is not precisely true, for the term Canon was applied in the 4th c. to cenobites living under a common rule; but the office of Canon is supposed to have been first instituted by Chrodegangus, or Chrodegang, Bp. of Metz, 763. It is at least certain that he was the author of the oldest canonical rule, which was simply an adaptation of the monastic rule (commonly but erroneously attributed to St. Augustine) to the priests and 'clerks' especially attached to the

service of a cathedral or other church. It enjoined on the canons manual labor, the practice of silence at certain times, confession twice a year, and other duties needless to specify. The canons formed the council of the bishop, and assisted him in the government of his diocese. They lived in a house called a *monastery*, slept in a common room, ate at the same table, and were originally supported out of the episcopal revenues. In 816, Louis le Débonnaire induced the Council of Aix-la-Chapelle to draw up a general rule for the whole body of canons. Canons found their way not long afterward into England, Scotland, and Ireland. Various reforms of C. were made in the 11th and beginning of the 12th c. Gradually, however, many began to emancipate themselves from the restrictions of monastic life, and to live independent of any rule, which is not at all surprising, for the canons were wont to keep apart from the 'lower clergy,' as they called parish priests and others who really labored among the people imparting religious instruction. They were often of noble families, and loved titles—at Lyon they were called *counts*—and in general were men of the world rather than true churchmen. Some of these remodelled canons were called black canons, from wearing a black cassock; others, white canons, from wearing a white habit like the *Præmonstratenses* of Picardy in France. The class of *secular* canons, whose manner of life was not conventual, which class therefore escaped destruction in England when the monasteries were abolished by Henry VIII., probably originated in a tendency to relax the severity of rule enjoined on the regulars, which indeed was hardly less stringent than in the case of ordinary monks. Secular canons still exist in the Anglican Church and their duties are much the same in kind as they were before the reformation. See CATHEDRAL.

CANON, in Music: a kind of fugue in which not merely a certain period or phrase is to be imitated or answered, but the whole of the first part with which the C. begins is imitated throughout by all the other parts. As in fugues, the melody of the part to be imitated is called the subject, and the others its reply. The C. is the highest degree of mechanical musical contrivance. The ancients spent more time in the construction and resolving of mere puzzling and unentertaining canons than in the cultivation of good harmony and melody. Good canons, however, are always interesting, and different from any other composition. For a full treatment of the method of writing a C., see Marpurg's *Abhandlung von der Fuge* (Peters, Leipzig).

CANON, in Philosophy, a rule or fundamental principle: also a collection of books that contain that rule. Considered as a rule, canon has a wide application in human thought. There are canons of logic, ethics, æsthetics, history, law, theology, etc., viz., the rules or methods which must be observed if the ends appropriate to these varied interests are to be fulfilled. These rules,

as would be expected, vary with the subject matter of the interest. For example, the rules of logic are essentially different from those of ethics or æsthetics.

As a collection of books, a canon includes all the literary productions on a given subject which have come to be considered final standards of authority. In non-Christian religions, as well as in Christianity, the sacred writings form the canons of their respective faiths. So, too, in secular interests whenever human inquiry ceases to be aggressive and relies for its direction upon the attainments of the past, certain representative writings of a by-gone age are always selected as limits of creed—legal, æsthetic, or what not—and become formed into a canon. See CANON LAW.

CANONICAL HOURS, *ka-nŏn′ĭk-al:* times fixed for divine service in the Rom. Cath. Church, but no longer strictly adhered to. These have not always been the same, and it is not known when nor by whom they were settled—some say by Popes Damasus, or Gelasius, or Gregory—but they are now fixed at seven; viz., Matins and Lauds, Prime, Tierce, Sext, Nones, Vespers, and Compline. These used to be observed as follows: Prime, Tierce, Sext, and Nones, at the first, third, sixth, and ninth hours of the day, counting from six in the morning; Vespers at the eleventh hour; Compline, or Completorium, as completing the services of the day, at midnight; and Matins shortly after midnight. The modern usage begins Matins at midnight, Prime at daybreak, Tierce at 9 A.M., Sext at noon, Nones at 3 P.M., Vespers at 6 P.M., Compline or Completorium at bed-time. These hours were by the Anglo-Saxons called Uhtsang, Primesang, Undersang, Middaysang, Noonsang, Evensang and Nightsang. The first two and the last formed the nocturnal, the remaining four the diurnal offices. The reasons given for the dividing the day into seven parts were —that in seven days the creation was completed, that seven times a day the just man falls, there are seven graces of the Holy Spirit, seven divisions of the Lord's Prayer, seven ages of a man's life, etc. The hours had also each its mystical reference to certain sacred occurrences, such as the incidents at our Lord's birth and crucifixion. The word 'hour,' in Canonical Hours is derived, as some have suggested, from *ora*, a prayer; but more probably from *hora*, an hour, and called canonical because according to the canon or rule of the church. The proper offices for the Canonical Hours are set forth in the BREVIARY (q.v.).

In the English Church the hours between 8 A.M. and 12 noon—the only time during which the solemnization of marriage is permitted—are called canonical hours.

CANONICUS, *ka-nŏn′ĭ-kŭs:* abt. 1565–1647, June 4: Narragansett chief. At first hostile to the Pilgrims, he became warmly attached to Roger Williams, to whom he granted lands in R. I. He maintained his friendly attitude toward the whites; but long after his death his

tribe was involved in King Philip's war, and was exterminated.

CANONIZATION, *kăn-on-i-zā'shŭn*, in the Church of Rome: act of the pope by which a deceased person is solemnly declared a saint. It had its origin in the practice of the early church, of inserting in the commemorative prayer of the Eucharistic Liturgy the roll of the names of those who had died as martyrs, or distinguished themselves as confessors of the faith, not for invocation (*'non invocantur,'* St. Aug. *De Civ. Dei*, xxii. 10), but in memory, for the comfort and example of the living. This record was entered in the diptychs of the church, and read in the so-called 'canon' of the liturgy. Each bishop, until the 10th c., had the power to declare particular deceased persons saints, doubtless with the consent of his clergy and people, and later of his metropolitan. The last recorded case by a metropolitan is said to have been that of St. Gaultier, by the abp. of Rouen, 1153 (see Gibbings, *Prælect on the Diptychs*, Dublin, 1864). In the West the exercise of this power came to be reserved to the popes, and the ceremonial itself was invested with solemnity, and regarded as of high importance. The first papal Cononization was accomplished by John XV. The popes have possessed the exclusive right since the decree of Pope Alexander III., 1170. The right of *Beatification* (q.v.) also belongs to them. When it is proposed to canonize a person of reputed sanctity the pope declares his views in a consistory, and an inquiry is instituted as to the virtues and merits of the person proposed. The form of inquiry is that of a regular process at law; and an ecclesiastic is specially appointed to contend against the claims advanced, who receives the designation of *Advocatus Diaboli;* and on failure of satisfactory proof the process is abandoned. When a favorable decision is pronounced the ceremony of Canonization is performed in St. Peter's Church with great pomp. The last Canonization was in 1881.

The Greek Church also recognizes *Canonization*. The right to perform the ceremony lies with the Patriarch of Constantinople, but it has rarely occurred. An analogy to Christian canonization has been found in the Apotheosis (q.v.) of the ancient Romans.

CANON LAW: the *Jus Canonicum*, a collection of rules, when the term is broadly used, for the regulation of dioceses, provinces and national Churches. It is commonly used in a restricted sense, meaning a particular body of Church law, the *Corpus Juris Canonici*.

Church laws in the main rest upon ancient practice or the decrees of general councils, and (among Roman Catholics) the decretal epistles and bulls of Bishops of Rome.

The oldest known collection of Church laws comes from Syria and is known as the *Apostolic Constitutions*, the major part of which belongs to the end of the 2d century. The Eastern Church recognized and accepted the

Constitutions in the council of Trullo which met in the emperor's palace in Constantinople in 692. This council codified the enactments of some ten eastern councils, including those of Antioch, Nicæa, Laodicocæa, Ephesus, Constantinople and Chalcedon, all belonging to the 4th and 5th centuries; and with these the ruling of some synods and prelates, and a number of canons enacted by themselves.

The body of law thus arranged, with canons passed by provincial synods or councils in Spain, Italy, France, and Africa, formed the basis for the canons of the modern Latin and Anglican Churches. They were gradually harmonized and reduced into method, but principally *Gratian's Decree*, a collection of ordinances, in three books, commenced by Ivo, Bishop of Chartres, 1114, subsequently corrected and arranged by Gratian, a Benedictine monk, 1150, after the manner of Justinian's *Pandects of the Roman Law.* This work comprises ecclesiastical legislation, as it may be called, from the time of Constantine the Great, at the beginning of the 4th c. to that of Pope Alexander III., at the end of the 12th c. *Gratian's Decree*, together with what are known as the *Decretals*, and the *Extravagants*, form the *Corpus Juris Canonici*, or great body of the 'Canon Law' as formerly received and administered by the Rom. Cath. Church. There are later publications of more or less authority, but which do not appear to have received the formal sanction of the holy see.

The *Decretals* are a collection of canonical epistles, in five books, written by popes alone, or assisted by some cardinals, to determine any controversy, and first published about 1230, by Raimundus Barcinus. They lay down rules respecting the lives and conversation of the clergy, matrimony and divorces, inquisition of criminal matters, purgation, penance, excommunication, and other matters deemed within the cognizance of the ecclesiastical courts. To these five books of Gregory, Boniface VIII. added a sixth, published 1298, called *Sextus Decretalium*, or the *Sext*, itself divided into five books, and all forming a supplement to the work of Barcinus, whose arrangement it follows. The *Sext* consists of decisions promulgated after the pontificate of Gregory IX. Then there came the *Clementines*, constitutions of Pope Clement V., published 1308. These decretals form the principal portion of the Corpus Juris Canonici. John Andreas, a celebrated canonist in the 14th c., wrote a commentary on them, which he entitled *Novellæ*, from a very beautiful daughter he had of that name, whom he bred a scholar; the father being a prof. of law at Bologna, had instructed his daughter so well in it, that she assisted him in reading lectures to his scholars, and therefore, to perpetuate her memory, he gave that book the title of *Novellæ*. The *Extravagants* of John XXII. and other later popes, by which term is meant to be denoted documents which transcend the limits of a particular collection of regulations.

This Canon Law, borrowing from the Roman civil law many of its principles and rules, has at different times undergone careful revision and the most learned and scientific treatment at the hands of its professors, and was generally received in those Christian states which acknowledged the supremacy of the pope; and it still gives ecclesiastical law more or less to Rom. Cath. Christendom, though its provisions have in many countries been considerably modified by the *concordats* (q.v.) which the popes now and then find it expedient to enter into with sovereigns and governments whose municipal system does not admit of the application of the Canon Law in its integrity. The fact of its main object being to establish the supremacy of the ecclesiastical authority over the temporal power, is sufficient to explain why, in modern times, it is found to conflict with the views of public law and government, even in the case of the most absolute and despotic governments.

This ecclesiastical system never obtained a firm footing in England, and the great lawyers and statesmen have always shown not only unwillingness to defer to its authority, but even aversion to its rule. There was, however, a kind of national Canon Law in England, composed of *legative* and *provincial* constitutions, adapted to the necessities of the English Church. The *legative* constitutions were ecclesiastical laws, enacted in national synods, in the reign of King Henry III., about 1220 and 1268. The *provincial* constitutions are principally the decrees of provincial synods, held under divers archbishops of Canterbury, from Stephen Langton, in the reign of Henry III., to Henry Chicheley, in the reign of Henry V., and adopted also by the province of York in the reign of Henry VI. At the dawn of the reformation, in the reign of Henry VIII., it was enacted in parliament that a review should be had of the C. L.; and till such review should be made, all canons, constitutions, ordinances, and synodals provincial being then already made, and not repugnant to the law of the land or the king's prerogative, should still be used and executed. And as no such review has yet been perfected, upon this enactment now depends the authority of the C. L. in England, the limitations of which appear, upon the whole, to be as follows: that no canon contrary to the common or statute law, or the prerogative royal, is of any validity; that, subject to this condition, the canons made anterior to the parliamentary provision above mentioned, and adopted in the Anglican system (for there are some which have had no reception among the English people), are binding both on clergy and on laity; but that canons made since that period, and having no sanction from the parliament, are, as regards the laity at least, of no force. See CANONS OF THE CHURCH OF ENGLAND.

In Scotland, Presbyterian though the ecclesiastical system of that country be, the old Roman C. L. still prevails to a certain extent. 'So deep hath this canon

law been rooted,' observes Lord Stair in his *Institutes of the Scotch Law*, 'that even where the pope's authority is rejected, yet consideration must be had to these laws, not only as those by which church benefices have been erected and ordered, but as likewise containing many equitable and profitable laws, which, because of their weighty matter, and their being once received, may more fitly be retained than rejected.' In two old Scotch acts of parliament, 1540 and 1551, the C. L. is used in conjunction with the Roman law to denote the common law of the country, the expression used being 'the common law, baith canon, civil, and statutes of the realme.' See, on the subject generally, the following authorities—Blackstone's *Commentaries*, by Kerr, vol. i. pp. 65 and 66; Stephen's *Commentaries*, 4th edition, vol. i. pp. 61 and 69—vol. ii. pp. 251, 256, 257, and 290—vol. iii. pp. 45, 48 and 421—and vol. iv. p. 242; Dr. Irving's *Study of the Civil Law;* Burn's *Ecclesiastical Law;* Phillimore, *Ecclesiastical Law* (2 vols., 1873); Rosshirt, *Kanonisches Recht;* Phillips, *Kirchenrecht* (8 vols., 1845–1875): also the articles in Wetzer and Welte's *Kirchenlexikon* (Rom. Cath.); Herzog's *Real. Encyklopädie* (Prot.); Knight's *Political Dictionary;* Wharton's *Law Dictionary;* Dr. Hook's *Church Dictionary.* In regard to Scotland, see Stair's *Institutes of the Law of Scotland*, I. 1, 13. and II. 8, 29; and Erskine's *Institutes*, I. 1, 28.

CANONS, Book of, in Scottish Ecclesiastical History: code of canons or rules for the Church of Scotland, prepared by the Scottish bishops, in obedience to the command of Charles I., revised by Laud, and confirmed by letters patent under the great seal, 1635, May 23. It tended much to increase the dissatisfaction prevalent throughout Scotland, which soon broke out so violently. It not only required the most strict adherence to the liturgy, then not yet published, but enjoined many things concerning ceremonies in worship beyond what Laud had been able to introduce in the Church of England; it also took away the powers of church-courts, and decreed the penalty of excommunication against all who should deny the government of the church by bishops to be scriptural, while its very first canon decreed that penalty against all who should deny the king's supremacy in ecclesiastical affairs.

CANONS OF THE CHURCH OF ENGLAND, the Constitutions and Canon Ecclesiastical, agreed upon, with the king's license, in the synod held at London, 1603–4. They were drawn up by the convocation in order to give effect to the decisions of the conference held at Hampton, and are, for the most part, a digest of old canons, with some new ones added. They are 141 in number. They are the basis of the ecclesiastical law, as far as the clergy are concerned, but they are not binding upon the laity except so far as they are declaratory of the ancient canon law. There had been a previous body of canons drawn

up in 1571, but these had not been sanctioned by the sovereign. In 1640, the convocation then assembled with the parliament prolonged its session beyond it, and passed a body of canons of a very arbitrary character, among other things enjoining that on some Sunday in every quarter every officiating minister should insist on the divine right of kings and their prerogatives, and enforce conformity to the rites of the Church of England. In these canons, it was directed that the communion table should be railed in, and be placed as in cathedrals, as is now done in all Anglican churches. These canons were abrogated by an act passed in the 13th year of Charles II. An account of these canons and those now in force may be found at length in Hook's *Church Directory*.—Every clergyman, when instituted to a benefice or licensed to a cure, promises CANONICAL OBEDIENCE to the bishop—i.e., the obedience due according to the canons of the church.

CANONS OF HIPPOLYTUS, THE: a book divided into 38 canons, believed to have been written by Hippolytus, archbishop of Rome, about the middle of the third century. It contains instructions in regard to the selection and ordination of Christian ministers, conversion and baptism of the heathen, rules for the celebration of the Eucharist, for fasting, etc. The book originally was made from a Coptic version of the Greek but has been handed down only in Arabic.

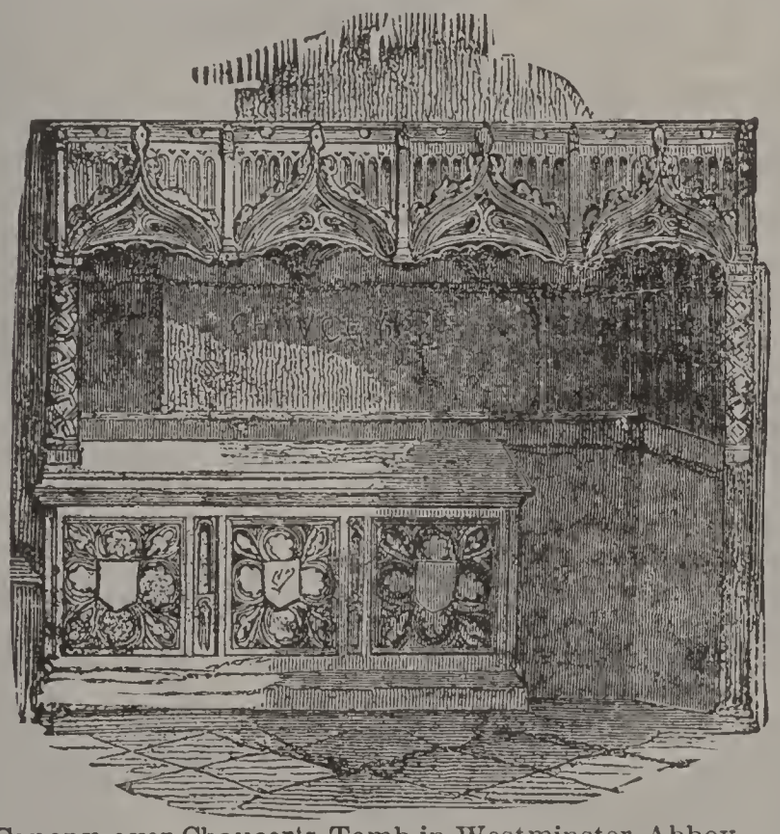
CANOPIC VASES, *ka-nŏp'ik:* vessels used by Egyptian priests to contain the viscera of embalmed bodies. They were arranged in a series of four—the first contained the stomach and larger intestines; the second, the smaller intestines; the third, the lungs and heart; and the fourth, the liver and gall-bladder; and each had on its lid the head of the particular deity who was supposed to preside over the contents.

CANOPUS, *ka-nō'pŭs*, or CANOBUS, *ka-nō'bŭs:* city of anc. Egypt, from which the Canopic mouth of the Nile derived its name, on the sea-coast 15 m. e. of Alexandria. The Canopic mouth of the Nile appears to have been at an early period the only one into which foreign ships could enter. At Canopus the boundary line between Asia and Africa was drawn by ancient geographers. There was a temple of Hercules here, which was a secure sanctuary to all who fled to it; also one of Serapis, as several extant Greek inscriptions show. The inhabitants, a mixed Egypto-Hellenic people, were infamous, in the Greek and Roman times, for their profligacy. The city declined after the rise of Alexandria. Traces of its ruins are visible about 3 m. from Aboukir.

CANOPUS: a very brilliant star of the s. hemisphere, in the constellation of the ship Argo, said by Plutarch to have received its name from Canopos, the pilot of Menelaus.

CANOPY, n. *kăn'ō-pĭ* [F. *canapé*, a couch, a canopy—from mid. L. *canopēŭm*, the sky, an umbrella—from Gr. *fōnōpeí'on*, a bed with gauze curtains to keep off flies: from

kōnöps, gnat or mosquito: comp. Gael, *ceann-bhrat*, a headcloth, a canopy]: a covering for protection against insects or for shade; a covering over a throne or a bed; a covering over the head; in *arch.*, an ornamental projection over a door, a window, etc. B. to cover with a canopy. CAN'OPYING, imp. *-pī-ing*. CAN'OPIED, pp *-pīd*. The derivation of the word canopy throws a curious light on its original meaning, which probably was a mosquito-curtain. The simplest form of C, in this its primitive sense, is that mentioned by Herodotus (ii.95), who says that the fishermen on the Nile were in the habit of suspending the net with which they had fished during the day on an upright pole, from which it was expanded into the form of a tent, and served to protect them from the attacks of insects during the night. As it has been proved that insects usually will not pass through the meshes of a net, though wide enough to admit them, this simple contrivance may have been effectual for its purpose. Horace (Epod. ix, 9), and others of the ancient writers, mention gnat-curtains (*conopea*). Subsequently, the same term came to be used for



Canopy over Chaucer's Tomb in Westminster Abbey.

the projecting covering and hangings of a bed, without reference to their original use, and latterly for any projecting covering of a similar form, for whatever use or of whatever materials. C. is thus used to signify the covering borne over the heads of kings and other persons of distinction, and still more frequently over the holy sacrament and the image of Christ, in processions in Rom. Cath. countries: see PALDACHIN.

In gothic architecture C. is the term applied to those rich coverings frequently seen over niches and tombs, and

sometimes over doors and windows. It belongs chiefly to the decorated and perpendicular styles, though known much earlier. The C. consists of a roof, which may be supported on pillars all round, or may have one, or if in an angle *two*, sides attached to the wall, with dependent ornamental work representing drapery. The early English canopies are usually simple in form; those in French buildings of the same period being greatly more complicated and elaborate, as, for example, those in the cathedrals of Chartres and Bayeux. In the decorated style, the canopies were richly ornamented and very various in form, as in the accompanying illustration. Some canopies are ornamented by pinnacles supporting smaller canopies, the whole terminating in a structure resembling a small turret, or crocketed spire. In the perpendicular style, though more varied in form, the canopies resemble those in the decorated. Most of the cathedrals and larger churches of England furnish examples of canopies, many of which are enumerated in Parker's *Glossary of Architecture*. For the use of canopies in Italian architecture, see BALDACHIN.

CANOROUS, a. *kă-nō'rŭs* [L. *canōrus*, melodious—from *căno*, I sing]: musical; tuneful. CANO'ROUSLY, ad. *-lĭ*. CANO'ROUSNESS, n.

CANOSA, *kâ-nō'sâ:* town of s. Italy, province of Bari, 13 m. s.w. of Barletta; on the declivity of a steep hill, on whose summit are the remains of an old castle. It has a cathedral; and in an adjoining court is a tomb to Bohemond, Prince of Antioch. It is notable chiefly in connection with the discovered antiquities of ancient *Canusium* (one of the chief cities of the Apulians, the origin of which is obscured in the mists of mythology) on the site of whose citadel the modern town is said to stand. The antiquities consist of subterranean sepulchres, containing painted vases and funereal furniture of the most magnificent description in perfect order, painted busts, and marble statues, etc. Many of the bodies found here were attired in cloth of gold, with head-dresses gleaming with precious stones, and earrings and bracelets of rich and exquisite workmanship. The objects were transferred to the museum at Naples. The ruins of an amphitheatre, aqueduct, etc., have also been found. C. suffered by earthquake in 1851. Pop. 18,500.

CANOSSA, *kâ-nŏs'sâ:* town of n. Italy, province of Reggio, about 12 m. s.w. of the city of Reggio, celebrated as the place whither, 1077, the Emperor Henri IV. of Germany went to obtain absolution from Pope Gregory VII., after three days' humiliation. The place, formerly of some importance, is now deserted.

CANOVA, *kâ-nō'vâ*, ANTONIO: 1757, Nov. 1—1822, Oct. 13; b. Possagno, a village in the Venetian territory: founder of a new school of Italian sculpture. Having evinced in boyhood great talent in modelling, the artist gained the patronage of Giovanni Faliero, a Venetian senator, by whom he was sent to work under a sculptor at Bassano. His first imaginative performance, *Eurydice*, half the size

PAULINE BONAPARTE, BY CANOVA.

of life, was executed in his 17th year. After this he went to Venice, where his study of art properly began. In 1779, Faliero sent him to Rome, with an introduction to Cav. Zuliano, the Venetian ambassador, and one of the most illustrious patrons of art at this time in Italy. In Rome the first result of his studies appeared in the statue of *Apollo,* which must be regarded as his earliest effort in ideal sculpture; but a far greater progress toward the pure style of the antique was evident in his next work, *Theseus with the Centaur.* Nevertheless, C. did not rigorously adhere to the severe simplicity of the antique, but rather took pains to mitigate it by a peculiar grace and loveliness of his own, such as characterized his group of *Cupid and Psyche,* produced soon after he had completed the monument of Pope Clement XIV. This is apparent even in the colossal nonument of Clement XIII. (erected in St. Peter's 1792); though this work, on the whole, is a magnificent effort of genius, simple in style, and with nothing overwrought in the figures. Among his works may be noticed a *Winged Cupid; Venus and Adonis;* a *Psyche holding a Butterfly; Penitent Magdalen,* in life-size; *Hercules hurling Lichas from the Rock,* a colossal work, not free from affectation; *Kreugas and Damoxenos* (two pugilists); *Palamedes;* and *Perseus with the Head of the Medusa,* a work which, more than all previous efforts, raised his fame. In 1802, C. was appointed by Pope Pius VII. chief curator of all Roman works of art in the Papal States; but was soon called away to Paris, to prepare the model of a colossal statue of Bonaparte.

After the fall of the French empire, C., in 1815, was employed by the Roman government as ambassador to recover the works of art which had been taken to Paris, and visited England. On his return to Rome, he was created Marquis of Ischia, with a pension of 3,000 scudi. This money he expended in the support of art and artists in Rome. C. died in Venice, and a marble statue was erected to his memory in the Church de' Frati, 1827. Another monument to C. was erected in the library of the capitol, by order of Leo XII., 1833.

It is universally allowed that to C. belongs the honor of having restored to sculpture the position which it had lost among modern fine arts. After Michael Angelo Buonarotti and Bernini, he was the third of epoch-making Italian sculptors. His delicate execution and masterly treatment of marble are unrivalled, and even his faults—viz., his exaggerated nicety and carefulness, and his use of corrosives to produce fine finish—served to attract by novel effects. The essential characteristic of all his works is sentiment—often verging however, on sentimentalism—and this also, like his delicacy in details, was accordant with the taste prevalent in his time, and was the chief cause of his popularity, as of his errors. When judged by the sterner principles of antique sculpture the works of C. are found deficient in that objective or realistic character which Thorwaldsen could express so well.

During his leisure hours C. amused himself in painting, in which he attained such excellence in following the color-

ing of the Venetian masters, that his pictures have even deceived connoisseurs. In his private life C. was amiable and benevolent. Biographies have been written by Missirini (4 vols. Prato, 1824), Cicognara (Venice, 1823), Rosini, (Pisa, 1825), and D'Este (Florence, 1864).

CANSO, *kăn'so*, CAPE; eastern extremity of Nova Scotia, and the s. boundary of the entrance of Chedabucto Bay: lat. 45° 17′ n., long. 61° west.

CANSO, STRAIT OF, or GUT OF: passage, 17 m. in length and 2½ m. in average breadth, connecting Chedabucto Bay with the Gulf of St. Lawrence, so as to form an island of Cape Breton. Of the three channels between that inland sea and the open ocean it is the one least frequently used by European vessels. It is much used by coasters.

CANSTEIN, *kân'stīn*, CARL HILDEBRAND, Count of: 1667, Aug. 4—1719, Aug. 19; b. Lindenberg. After studying law at Frankfort on the Oder, and travelling in Italy and England, he became chamberlain to Frederick III., Elector of Brandenburg, and served as a volunteer in a campaign in Flanders. Leaving the army from ill health, he came under the influence of Spener and Franke, devoted himself to pious labors, and founded the Canstein Bible Soc. of Halle, for which he raised a large sum by subscriptions. His plan for diffusing religious knowledge was set forth in *Ohnmassgebender Vorschlag*, 1710. His stereotyped edition of the New Test. appeared 1712, and was sold at about eight cents; the entire Bible followed, 1713. C. wrote a *Harmony of the Gospel*, 1718, a *Life of Spener*, 1729, and a few theological works. He died at Berlin, bequeathing his library and part of his fortune to the orphan asylum at Halle.

CANT, v. *kănt* [Gael. *cainnt*, speech, language; *can*, to sing, to name: L. *canto*, I sing]: to speak in a whining tone of voice; in *OE.*, to sell by auction: N. whining, affected, or hypocritical speech; the language peculiar to a trade, profession, sect, or fraternity; barbarous jargon: ADJ. slang. CANT'ING, imp.: ADJ. speaking in a whining tone of voice: N. the talk of one who uses customary religious phrases without any deep or definite meaning. CANT'ED, pp. CANTER, n. *kănt'ĕr*, one who cants. CANT'INGLY, ad. *-lĭ* CANTY, or CANTIE, a. *kăn'tĭ*, in *Scot.*, talkative and cheerful. *Note.*—CANT, in *politics*, is to use cut and-dry phrases without attaching any definite meaning to them; while to RANT (which see) is to treat very little matters as if they were big ones.

CANT, v. *kănt* [Ger. *kanten*, to put a thing upon its edge, to tilt: Dan. *kant;* Sp. *canto*, edge, angle]: to pitch forward; to place upon the edge, as a cask; to jerk; to throw; among *carpen.*, to cut off an angle from a square piece of timber: N. an inclination from a horizontal line; an angle; a thrust: a push; on shipboard, such timbers, near the bow and stern, as lie obliquely to the line of keel. CANT'ING, imp.: ADJ. turning up on edge; giving a sudden thrust.

CAN'T, *kânt:* contracted for *cannot.*

CANT, *kănt*, ANDREW: Scottish divine of the 17th c. (d. abt. 1664): first minister of Pitsligo, in the n. of Scotland, and afterward in Aberdeen. In 1638, July, he was one of the commissioners sent to Aberdeen to compel the inhabitants to subscribe the National Covenant; and in Nov. he was a member of the memorable general assembly, at Glasgow, which abolished episcopacy in Scotland. He was with the Scots army when it obtained possession of Newcastle, 1640, Aug. 30; and in 1641, on the second visit of Charles I. to Scotland, C. preached before his majesty at Edinburgh. In 1660, in consequence of a complaint presented to the magistrates of Aberdeen, charging him with having published a seditious book, entitled *Lex Rex*, and with fulminating anathemas and imprecations against many of his congregation, C. relinquished his charge and left the town.

CANTAB, n. *kăn'tăb*, or CANTABRIDG'IAN, n. *-tă-brĭj'ĭ-ăn:* a member or scholar of Cambridge University.

CANTABILE, *kăn-tăb'i-le* or *kăn-tâ'bē-lā*, in Music: a term having several meanings. In general, it is placed over passages of easy and flowing melody, as well in instrumental as vocal music. In songs, the melodies which lie chiefly in the middle region of the voice are marked C.: extreme tones of the voice have a peculiar *timbre* and character quite foreign to the cantabile. C. marked at the beginning of a piece means rather slow than quick. In the C. style the finest effects can be produced by the singer in swelling, sustained sound, the portamento, etc. C. is also called *cantilene*.

CANTABRI, *kăn'tâ-brī :* rude race of mountaineers in anc. Spain, of Iberian origin; in the district now known as Burgos, and on the coasts of the Bay of Biscay, which derived from them the name, *Oceanus Cantabricus*. The most important of their nine towns were Juliobrica (near the source of the Ebro), Vellica, and Concana. The C. are described as like the Scythians and Thracians in hardihood and martial character, sleeping on the bare earth, enduring extreme pain without a murmur, and, like most savages, leaving agricultural toil to their women. Their bravery was evinced in the Cantabrian war, a six years' contest with the Romans, begun under Augustus, and concluded by Agrippa, B.C., 25–19. Tiberius afterward stationed garrisons in the towns of the conquered C.; but some of them retreated into fastnesses among the mountains, where they preserved their independence. They are supposed to be the ancestors of the BASQUES (q.v.).

CANTABRIAN, a. *kăn-tā'brĭ-ăn:* pertaining to Cantabria, on the Bay of Biscay, in Spain.

CANTABRIAN MOUN'TAINS, *kân-tā'brĭ-an:* general name of the several ranges of coast and boundary mountains, along the n. coast of Spain, from Cape Finisterre, to the s. base of the West Pyrenees, dividing the coast districts from the interior elevated plateau of Castile. The summits of the mountains here and there reach the lower line of the snow region, with a more gentle slope on the s. side, and

form plateau-districts from 1,600 to 2,000 ft. high on the n. where the slopes are steeper and intersected by coast rivers, leaving in several parts only narrow strips of flat coastland. In some places the mountains thrust themselves as bold promontories into the sea. The whole group of mountains is named variously by the people of various localities, and includes the Sierra de Aralar, Salvada, Anagna, Sejos, Albas, and Altuna—all more or less wild and romantic, but having those fertile and prosperous trading districts which distinguish the Basque Provinces and Asturias from the sterile central plateau of Spain.

The anc. Cantabria included almost all the Spanish coast of the Bay of Biscay; it is now restricted to the Province of Santander and a part of Asturias. It is a mere popular designation, not the name of a province.

CANTAL, *kŏng-tâl':* central department of France, formed out of the s. portion of the old province of Auvergne; 2,090 sq. m.; pop. 218,941. See AUVERGNE.

CANTALEVER, or CANTLIVER: see CANTILEVER.

CAN'TALOUPE, or CANTALEUP, or MUSK-MELON: a variety of melon, named from Cantalupo, Italy. It thrives in s. Europe, and is abundant in the middle and southern states. See MELON.

CANTANKEROUS, a. *kăntăn'kĕr-ŭs* [comp. Gael' *ceantana-cearr*, a shallow wrong-head—from *cean*, head; *tana*, shallow; *cearr*, wrong]: applied to a quarrelsome, shallow-headed person; in *familiar language*, cross-grained; ill-conditioned in temper. CANTAN'KEROUSNESS, n. crossness; ill-humor; petulance.

CANTARINI, SIMONE; known also as SIMONE DA PESARO, or IL PASARESE: Italian painter: 1612—48, b. Pesaro. He studied under Guido Reni at Bologna; but his intolerable arrogance made him numerous enemies, and he left the city and went to Rome, where he won high reputation and was thought by many to excel even his master in the graceful finish of his brush. On his return to Bologna he opened a school, but soon accepted an invitation from the Duke of Mantua to visit that city. Here also his excessive self-esteem involved him in disagreeable relations with everybody, and at last he quarreled with the duke himself, on which he left for Verona, where he died, under suspicion either of having poisoned himself or of having been poisoned by a Mantuan painter whom he had injured. Cantarini was distinguished in modelling and flesh-coloring. A *Madonna upborne by Angels*, and a head of Guido when old, in the gallery at Bologna, and others elsewhere, remain as proofs of his skill. His 37 etchings closely resemble the etchings of Guido Reni, and have, in several instances, been fraudulently sold with the mark of this master forged upon them.

CANTATA, n. *kăn-tä'ta* or *kăn-tā'tă* [It.—from L. *canto*, I sing]; a poem set to music. The term is applied indefinitely, and scarcely indicates a traceable distinction from

other kinds of musical composition. In Zedler of Halle's great *Lexicon*, the Cantata is defined as a 'long vocal composition, the text of which is Italian,' etc.; while in Sulzer's *Theorie der Schönen Künste*, it is said to be 'a short piece of vocal music of a pathetic nature,' etc. The C. is always more extended and wrought out than the simple song, and consists of different movements.

CANTEEN, n. *kăn-tēn'* [F. *cantine*—from It. *cantina*, a wine-cellar]: a tin or wooden vessel for carrying a liquid; the soldier's mess-tin carried on the knapsack; leathern or wooden chest, in compartments, containing the plate and other table equipage for a military officer in active service; the refreshment house attached to barracks. The chief articles of food are supplied to the troops direct by the government; but wine, malt liquor, and small grocery-wares, the soldier is left to buy for himself; and in the British army organization the canteen is, or is intended to be, a shop where he can make these purchases economically without going beyond the precincts of the barrack. No soldier is obliged to buy anything at the canteen; he may lay out his small sums elsewhere if he prefer. Since 1847 the sale of ardent spirits has been prohibited, and the profits of the Canteen are now applied for the benefit of the men of the corps.

In French barracks the canteen is a sort of club-room for the whole regiment. The cantineer is a non-commissioned officer, who acts merely as an agent for all, selling the liquors and commodities at prime cost.

Previous to 1901, beer and wine were allowed to be sold at the canteens in the United States army, though spirits were prohibited. In that year an anti-canteen law went into effect, as the result of temperance agitation. There has been wide discussion as to the merits and demerits of this law.

The United States Congress in 1902 appropriated $500,000 to build and maintain suitable buildings at army posts, for the recreation and sociability of the men, and also increased the rations five cents per day, to enable them to procure more delicacies without depending upon the profits of a liquor-selling canteen. When these buildings come into general use, and statistics can be had for a long period, it will be possible to form a more accurate opinion as to the wisdom of abolishing the canteen.

CANTER, n. *kăn'tėr* [a contr. of *Canterbury* gallop: comp. Scot. *cant*, to ride at a hard gallop; *canty*, lively, cheerful]: a lively or cheerful ride; a moderate gallop: V. to run, as a horse in an easy gallop. CAN'TERING, imp. CAN'TERED, pp. *-tėrd*.

CANTER, *kân'tėr*, WILLEM: Dutch philologist: 1542-1575; b. Utrecht; was reported to have cared for naught but study. He removed to Louvain, published editions of Æschylus, Euripides, and Sophocles, and a number of critical and philological works, one of which, *New Readings*, was highly praised by Hallam as having done much for ancient literature.

CANTERBURY, n. *kăn'tẽr-bĕr'ĭ* [from a city in England]: a stand or receptacle for music, etc. CANTERBURY-BELLS, species of *campanula* (q.v.); the *Campăn'ŭla medĭum*, and *C. trachĕlĭum*, ord. *Campănŭlā'cĕæ*.

CANTERBURY, *kăn'tẽr-bĕr-ĭ:* municipal and parliamentary borough, a county by itself, cathedral city, and seat of the metropolitan see of all England, in East Kent, on the Stour, 56 m. e.s.e. of London, on the high road from London to Dover. The distance from London by the Southeastern railway is 81 m.; by the London Chatham and Dover line, about 60. It stands on a flat between hills of moderate height. It has little manufacture or traffic, though it is noted for its brawn. The chief trade is in corn, wool, and hops The hop-grounds employ many workers. Pop. (1891) 23,026; (1901) 24,868. C., which formerly returned two members to parliament, was disfranchised for bribery, 1883, but recovered one member, 1885. Some remains of the walls (1¾ m. in circuit and 20 ft. high) which formerly surrounded C. and one of the gates, are still visible. Near the city wall is a large artificial mound, known as the Dane John (probably *Donjon*), and connected with this mound is a public garden, laid out in the end of the 18th c., from the top of which is a fine view of the country around.

The great glory of C. is its magnificent cathedral. When St. Augustine became Abp. of Canterbury, 597, he consecrated, under the name of Christ's Church, a church said to have been formerly used by Roman Christians. Cuthbert, the 11th abp., 740, added a church to the east of this. In the course of ages it received numerous additions, until it assumed its present magnificent form. Among those who helped to repair, enlarge, and rebuild it, were Abps. Odo (940), Lanfranc (1070), and Anselm (1093). In 1174 the choir was destroyed by fire, and in order to the rebuilding of it a number of French and English artificers were summoned. Among the former was a certain William of Sens, and to him, a man of real genius, the work was intrusted. The church was rich in relics: Plegemund had brought hither the body of the martyr Blasius from Rome; there were the relics of St. Wilfred, St. Dunstan, and St. Elfege; the murder of Thomas à Becket (q.v.) had recently added a still more popular name to the list of martyrs. The offerings at these shrines, especially the last, contributed greatly to defray the expenses of the magnificent work. William of Sens did not, however, live to see its completion. He was succeeded by another William, an Englishman, and to him is due the completion of the existing unique and beautiful choir, terminated by the corona or circular chapel called Becket's crown. Gervasius, a monk, who witnessed the fire of 1174, and has left an account of it, relates that the parts of Lanfranc's church which remained in his time were the nave, the central and western towers, the western transepts, and their eastern chapels. In the 14th c., the nave and transepts were transformed into the perpendicular style of that period. The central tower, called the angel steeple, was carried

Photograph by J. Horace McFarland Co.

CANTERBURY BELLS (Campanula).

up (1486–1504) to about double its original height, also in the perpendicular style; it is 234 ft. high, and 35 ft. in diameter. The n.w. tower was taken down in 1834; it was 113 ft. high, and divided into five stories. The Norman plinth still remains on each side of the nave in the side aisles, and portions of Norman ashlaring may still be seen about the transepts outside the west wall, and on the east piers of the great tower. The indiscriminate use of the 'Round' or 'Norman,' and the 'Pointed' or 'Early English' arch, is also a very striking feature in the eastern part of the building. The Lady Chapel, now called the Dean's Chapel, stands on the north side of the church, and was built in 1468; the roof is a fan-vault. The north transept is called the Martyrdom, for here took place the murder of Becket, 1170, Dec. 29, Tuesday. Fifty years later the remains were translated from the crypt to a shrine in the newly-erected Trinity Chapel, eastward of the choir. About the year 1500, the yearly offerings at this shrine amounted to £4,000; but they had then declined much in value. A curious mosaic pavement still remains in front of the place where the shrine stood, and the stone steps which lead up to it are worn by the knees of countless pilgrims; but the shrine itself was demolished in 1538, and the bones of the saint burned by order of Henry VIII. In 1643, the building was further 'purified,' as it was called, by order of parliament. Still very many most interesting monuments remain—such as the tombs of Stephen Langton; that which is commonly, but wrongly supposed to be the tomb of Abp. Theobald; with those of the Black Prince, of Henry IV., of Abps. Maphan, Peckham, Chicheley, Courtenay, Sudbury, Stratford, Kemp, Bourchier, Warham, and of Cardinal Pole. The total exterior length of the cathedral is 545 ft. by 156 in breadth at the eastern transept. The crypt is of greater extent and loftier—owing to the choir being raised by numerous steps at the east end—than any other in England.

The Archbishop of C. is primate of all England, metropolitan, and first peer of the realm. He ranks next to royalty, and crowns the sovereign. His ecclesiastical province includes all England, except the six northern counties. Among his privileges, he can confer degrees in divinity, law, medicine, and music. His seats are at Lambeth and Addington Park. He is patron of 149 livings, and has an income of £15,000 a year. There are fourteen old churches in C., mostly of rough flint, and containing fragments of still older structures. St. Martin's Church stands on the site of one of the 7th c., and is built partly of ancient Roman brick and tile. Attached to the cathedral is a grammar school, remodelled by Henry VIII. Part of St. Augustine's Benedictine abbey still remains, with its fine gateway, near the cathedral. It occupied, with its precincts, 16 acres. The old buildings have lately received large modern additions, in order to fit them for the purposes of a missionary college in connection with the Church of England. Another recent institution for

education is the clergy orphan school, which occupies a conspicuous position on St. Thomas's Hill, about a mile out of the city. The ruins of a Norman castle, 88 by 80 ft., the third in size in England, stand near the city wall. Canterbury stood, in Roman times, at the union of two Roman roads from Dover and Lympne, the chief seaports of the Romans. Canterbury was the capital of Kent, and the centre from which England was christianized. St. Augustine, the Apostle of England, sent by Gregory I., was the first abp., and baptized King Ethelbert of Kent. Canterbury was the Saxon *Caer Cant*, City of Kent, and cap. of the kingdom of Kent. The Danes in the 9th, 10th, and 11th c. often ravaged and burned the city. Henry VIII. confiscated the treasures of the cathedral, and Edward VI. levied fresh exactions from it. The cathedral suffered much in the parliamentary struggles, but it has since been repaired.

CANTERBURY: now a provincial dist. of New Zealand, in the South Island; but till 1876 a province, with Christchurch as its capital, and Lyttleton as its port. The dist. was settled 1850 by the Canterbury Assoc., a society of peers, bishops, and commoners interested in the colonization of New Zealand. It has an area of abt. 14,000 sq. m., a coast-line of about 200 m., and is well watered by numerous rivers. On the e. side of the great range of hills are the far-famed Canterbury plains, the great sheep district of the colony. The natural pastures of Canterbury are fine; and to this circumstance is mainly due the rapid advance in prosperity of the country. Excellent timber grows in the province. A vast coal-field seems to underlie the whole country, and coal is worked in the districts of Timaru and Malvern. Good fire-clays, quartz, sand for glassmaking, marble, limestone, etc., are also found. The productions include wool, grain, skins and hides, butter, cheese, and some silk. Pop. 143,040.

CANTERBURY-BELL, a name given to species of *Campanula*, especially *C. medium* and *C. trachelium*.

CANTERBURY TALES. See CHAUCER.

CANTHAREL'LUS: see FUNGI, EDIBLE.

CANTHARIS, n. *kăn'thăr-ĭs*, CANTHAR'IDES, n. plu. *-ĭ-dēz* [Gr. *kanthăris*, a small beetle]: genus of insects of the order *Coleoptera*, section *Heteromera:* see COLEOPTERA. It belongs to a family called *Trachelides*, or necked beetles, the head being separated from the thorax by a distinct neck or pedicle, and forms the type of a subdivision of that family called *Cantharidiæ*, many of the species of which possess blistering properties analogous to those of the common BLISTERING FLY, SPANISH FLY, or BLISTER BEETLE (*C. vesicatoria*). This insect, the best known and most important of the genus, is about an inch long; has a large heart-shaped head, rather broader than the thorax; thread-like antennæ three times longer than the head; a nearly quadrangular thorax; and soft elytra (wing-covers) concealing the abdomen, and of equal breadth

throughout. It is of a bright, glossy, green color. The common blistering fly is found in the s. of Europe, and in the s. of Siberia. It is abundant in Italy, Sicily, and Spain, in the s. of France, and in some parts of Germany and Russia. It is rare in England. The larva is not well known. The perfect insect feeds on the leaves of the ash, privet, lilac, elder, and honeysuckle; and rests on them during the night, the day being its time of activity. It is therefore taken by beating the branches of the trees in the morning or evening, when it is comparatively lethargic, a cloth being spread below to receive the insects as they fall. The gathering of *Cantharides* takes place, in the s. of France, in the month of May. It requires great caution to prevent injury to those who engage in it, the insects emitting a volatile substance with a strong smell, which causes inflammation of the eyes and eyelids, convulsive sneezing, and irritation of the throat and bronchial-tubes, nor can they be handled without danger of blistering. Those who collect them, therefore, generally wear gloves and veils. Unpleasant effects have been experienced from even sitting under trees on the leaves of which cantharides were numerous. Various methods are employed for killing cantharides when they have been taken; the cloths containing them are very generally immersed in hot vinegar and water, and they are afterward carefully dried; sometimes they are killed by the vapor of vinegar, and sometimes by oil of turpentine. Unless kept with great care, they soon begin to lose their active properties, although in stoppered bottles they remain fit for use for years. They are very liable to be injured by mites, and afford a favorite food also to a kind of moth and to some other insects.

CANTHAR'IDINE, n. *-ĭ-dĭn*, the active principle of the blistering flies, has such powerful blistering properties that $\frac{1}{100}$th of a grain placed on the lip rapidly causes the rise of small blisters. Administered internally, blistering flies cause heat in the throat, stomach, intestines, respiratory organs, etc.; and if in large doses, they give rise to inflammation of a serious nature, and sufficient to cause death. Externally, they are employed as a *blistering agent*. There are various medicinal preparations of blistering flies, such as *Vinegar of Cantharides*, obtained by macerating blistering flies in acetic acid; *Tincture of Cantharides*, procured by digesting blistering flies in proof-spirit, etc.; but that most commonly employed is *Plaster of Cantharides* or *Blistering Plaster*, obtained by mixing equal parts of blistering flies, yellow wax, resin, and lard. See BLISTER.

CANTHUS, n. *kăn'thŭs* [L. *canthus;* Gr. *kanthos*, the iron ring around a wheel]: the angle or corner of the eye.

CANTICLE, n. *kăn'tĭ-kl* [L. *cantic'ulum*, a little song—from *can'tĭcum*, a song, a ballad—from L. *canto*, I sing]: in *OE.*, division of a poem; a canto. CAN'TICLES, n. plu. *-tĭ-klz*, the Song of Solomon, or Song of Songs; the Hymns, Benedictus, etc., in the English Prayer-book. CANTION, n. *kăn'shŭn* [L. *cantĭōnem*, a song, a charm]: in *OE.* a song.

CANTICLES, *kăn'tĭ-klz,* or SONG OF SOLOMON: a canonical book of the Old Testament, called in Hebrew *The Song of Songs*—i. e., the most beautiful song. The author is commonly supposed to be Solomon, and in the rich luxurious splendor of its coloring, it admirably harmonizes with the 'golden time' of that magnificent monarch. The theme which it celebrates is love; but what kind of love, whether earthly or spiritual, is a question that has perplexed biblical critics. The oldest interpretations are allegorical and are either political or religious. The former of these considered C. as the symbolical expression of a deep longing for the reunion of the kingdoms of Judah and Israel; the latter, of the love of God for his chosen people, the Jews. The religious interpretation passed over from Judaism to Christianity, and assumed a new aspect in consequence. Origen found the beloved bridegroom in Christ, and the bride in the church or the believing soul. Only among the theologians of the Syrian school do we find an effort made to adhere to more intelligible principles of interpretation, but the 'mystical view' obtained the upper hand, and has continued predominant among orthodox theologians. For a while an attempt was made to distinguish between a primary and a secondary sense, both more or less directly present to the mind of the author; but modern scholarship in the main contents itself with endeavoring to fix the primary or literal meaning. Nor is this easy. Some commentators hold, for example, that C. is an anthology of detached idyls; others argue that it is a dramatic unity composed of connected parts. Ewald has done much to establish the latter view, though he advances a theory, known as the 'shepherd theory,' very different from the traditional theory, which also holds to the dramatic unity of the whole. Ewald's followers hold that the poem was written about the middle of the 10th c. B.C. in a spirit of hostility against the luxurious court of Zion. Solomon, the type of a sensual monarch, has carried off to his harem a northern shepherd maiden, who in the poem appears surrounded by the ladies of his court. The king fails even by the proffer of honorable espousals to overcome the maiden's fervent attachment to her shepherd lover in the north country, and wholly abashed, ceases to press his suit. Finally, true and chaste love triumphs in the union of the peasant lovers.

Against this plausible shepherd theory it is pointed out that it is irreconcilable with the passage iii. 6—v. i., in which a royal marriage is depicted most happily consummated. It also requires an interpolation between iv. 7 and iv. 8. Delitzsch advances other arguments for the traditional view, which is that the poem depicts conjugal love in its purity and sweetness—a type of the marriage of which the Messianic Psalm xlv. sings.

CANTILENE: see CANTABILE.

CANTILEVER, n. *kăn'tĭ-lĕv'ẽr,* or CAN'TALEV'ER, or CANTALIVER, or CANTLIVER [*cant,* an angle, and *lever,* the supporter of a roof-timber]: in *arch.,* a projecting block or

large bracket for supporting, as under a balcony, or the eave of a house, or upholding a stairway.

CANTILEVER, or CANTALEVER, BRIDGE: originally applied to house-building, the term has become better known in its application to the construction of one form of bridge, in which, without central support, two long brackets or arms are built out, one from either bank—each being securely anchored or counter-balanced on the shore, and both brackets meeting in the middle, where the two ends are joined, forming the cantilever span. The best instance of this kind of bridge is the famous cantilever bridge across the Hudson river at Poughkeepsie, N. Y., completed in 1889. It is about the longest double-track railroad bridge in the United States, and the longest in the world, excepting the bridge over the Firth of Forth, in Scotland, opened in 1890. The manner of construction of the cantilever spans of the Poughkeepsie bridge is as follows: false works were first built under the truss spans, upon piles 130 ft. long, driven down into the bottom of the river, over 500 piles being required to each span. These false works were carried up 130 ft. above high water, and upon them was laid a track, upon which a huge traveller, the largest ever built in this country, was placed; then a hoisting engine was hoisted to the floor of the false works, which lifted the steel work into place. When the truss was completed the false works were removed and the piles pulled out, leaving the river unobstructed. The cantilever spans are built out piece by piece over the river without false works or other support from below, the traveller running out upon the portions just erected until the opposite arms are joined together. There are three cantilever spans to the Poughkeepsie bridge, each 548 ft. long and weighing 1,600 tons.

CANTIRE, *kan-tīr′*, or KINTYRE, *kin-tīr′* [Gaelic, headland]: long narrow peninsula of Argyleshire, running n. and s. between Arran Isle and the Atlantic, and united at the n. end with the mainland of Scotland by the isthmus of Tarbet, a mile broad between East Loch Tarbet, a small loch or bay of Loch Fyne, and West Loch Tarbet. Cantire is 40 m. long, and, on an average, 6½ broad. The surface is much diversified by low, undulating, moorish hills, with many lochs. The highest point is Bennear, 1,515 ft. It contains much cultivated land. The n. four-fifths of Cantire, and the s.w. corner round the Mull, or promontory, of Kintyre, consists chiefly of mica slate. Old red sandstone occurs on the s.e. shore. Coal is found between Campbeltown and the w. coast. A light-house, 297 ft. above the sea, stands on the Mull of Kintyre. Cantire includes 10 parishes. Campbelton (q.v.) is the chief seat of population. Cantire was in ancient times peopled by Picts and Celts more densely than the rest of Scotland. The Scots from Ireland subdued it A.D. 210, were expelled from it, 446, but returned 503, under Fergus, the first Scottish king, who fixed his seat at Campbelton. Kenneth II. (MacAlpine), on defeating the Picts 843, removed to For-

teviot. From the 8th to the 12th c. Cantire was occupied by Northmen from Scandinavia, afterward by the Macdonalds of the Isles, and more lately by the Campbells. Many burying-grounds and small ruined chapels or monasteries in Cantire, show its former populousness. Near these chapels, and in the villages, are many high, upright slate crosses, with rude figures and inscriptions on them. Pop. abt. 18,000.

CANTLE, or CANTEL, n. *kăn'tl* [OF. *chantel*, a cantle, a hunch—from mid. L. *cantel'lus*, dim. of *cantus*, a corner: Icel. *kantr*, a corner]: in *Scot.* and *OE.*, a piece or corner of a thing broken off; a hunch, as of bread; a fragment; the hind bow or protuberance of a saddle: V. to cut in pieces. CANT'LING, imp. CANTLED, pp. *kănt'ld*. CANTLET, n. *kănt'lĕt*, a broken piece; a cantle.

CANTO, n. *kăn'tō* [It. *canto*, a song: L. *cantus*, singing —from *canto*, I sing]: a part or division of a poem; in *music*, the leading part; a song. CANTO FERMO, in *church music*, plain song, or choral song in unison, and in notes all of equal length; introduced, it is said, by Pope Gregory the Great, before the invention of the modern notation: see also GREGORIAN TONES. CANTILLATE, v. *kăn'tĭl-lāt*, to chant, to recite musically. CAN'TILLA'TING, imp. CAN'TILLA'TED, pp. CAN'TILLA'TION, n. *-lā'shŭn*, chanting; reading or reciting with musical cadence.

CANTON, n. *kăn'tŏn* [F. *canton;* It. *cantone*—from *canto*, a corner; mid. L. *cantōnum*, a region, a province]: a small division of land; a division of a country, constituting a separate local government or state, as in Switzerland; in France, a subdivision of an arrondissement; in *heraldry*, one of the nine honorable ordinaries, occupying a corner of the shield either dexter or sinister, and in size one-third of the shield: V. to divide into districts or cantons; to allot quarters to troops. CAN'TONING, imp. CAN'TONED, pp. *-tŏnd*. CAN'TONAL, a. pertaining to or divided into cantons. CANTON'MENT, n. the part of a town or village assigned to a body of troops; separate quarters for soldiers; in the general operations of European armies, temporary resting-places. Many circumstances, especially the state of the weather and the supply of food, influence a general in determining whether to go into cantonments or to encamp, in the intervals between active operations; or he may take the former course during an armistice. The quarter-master-gen. previously examines the district, and determines how many men and horses to place in each village; arrangements are also made for a main-guard, cavalry pickets, alarm-posts, road-barricades, lines of sentries, mounted orderlies, etc., to guard against a sudden surprise from the enemy. In cantonments the men are not generally under canvas, as described in CAMP. In India, cantonments are *permanent* places, regular military towns, distinct and at some little distances from the principal cities. If on a large scale such a cantonment contains barracks for European cavalry, infantry and artillery:

rows of bungalows or houses, each inclosed in a garden, for the officers; rows of huts for the native soldiery; magazines and parade-grounds; public offices and buildings of various kinds; and a bazaar for the accommodation of the native troops.

CANTON, *kăn'tŏn:* city of Fulton co., Ill., 28 m. w.s.w. of Peoria and 12 m. w. of the Illinois river; at the intersection of the Toledo, Peoria and Warsaw railroad with a branch of the Chicago, Burlington and Quincy railroad. It has coal mines, iron foundries, manufactories of wagons, farm implements, and cigars; a packing-house, five good school buildings, seven churches, a library, a fire dept., and two weekly papers. Pop. (1910) 10,453.

CANTON: village and township of Norfolk co., Mass., 15 m. s. by w. of Boston, on the Boston and Providence railroad. The Neponset river affords water-power to several cotton, woolen, and silk mills. Canton has a bank and several churches. Pop. (1910) 4,797.

CANTON: village and township of Lewis co., Mo., on the Mississippi river, about 185 m. n.n.w. of St. Louis, 17 m. from Quincy, Ill. The Mississippi Valley and Western railroad passes through it. It has a river trade, and contains Canton Univ., a school of the 'Christians' or Disciples, two banks, wagon and plow factories, some other manufactures, and a weekly paper. Pop. 3,100.

CANTON: cap. of St. Lawrence co., N. Y., on the Rome, Watertown and Ogdensburg railroad, 60 m. n.e. of Watertown. Grass river affords water power to manufactures of lumber, flour, leather, machinery, etc. Canton contains the county buildings and those of St. Lawrence Univ., Universalist institution, with depts. of law and theology. It has several churches and a weekly paper. Pop. (1910) 2,701.

CANTON: city and cap. of Stark co., Ohio, on the Pittsburg, Ft. Wayne and Chicago railroad, 102 m. w.n.w. of Pittsburg, 54 m. s.s.e. of Cleveland. Two branches of Nimishillen creek unite here. Canton derives its water supply by a Holly engine from a lake 3 m. n.w. It is the centre of a rich farming country, with abundant coal and limestone near, but relies largely on its manufactures of iron, wool, plows and farm implements, saws, safes, printing-presses, etc. It contains St. Vincent's (Rom. Cath.) College, an academy, several banks, and many churches. Four newspapers are published here. Pop. (1900) 30,667; (1910) 50,217.

CANTON, S. D.: the capital of Lincoln county, on the Sioux river, 20 miles from Sioux Falls. It is on the Chicago, M. & St. P. R.R., and is the seat of Augustana College. The town contains eight churches, public schools, and important manufactories, is lighted by electric light, and has other public improvements. Pop. 1,943.

CANTON: large commercial city and port in the s.

of China, cap. of the province of Kwang-tung (of which the name C. is merely a corruption). It is in lat. 23° 7′ 10″ n., long. 113° 14′ 30″ e., on the n. side of the Choo-keang, or Pearl river, in a rich alluvial plain, 32 m. from the sea. The river (the entrance to which is known by the name of the Boca Tigris, a Portuguese translation of the Chinese *Hu-mun*, 'Tiger's Mouth') is very picturesque. The city is surrounded by a brick rampart 6 m. in circumference, and entered by 12 gates, to each of which a guard-house is attached. It forms an irregular square, and is divided by a wall into the North and South, or Old and New city. The former is inhabited by the Tartar population, the latter by Chinese; and between the two communication is maintained by four gates in the separating wall. The suburbs are very extensive, and in one of these, facing the river, stood the European factories or *hongs*. Most of the streets of Canton are crooked and labyrinthine beyond description, but there are a small number of straight thoroughfares which make it easy for a stranger to find his way. As a rule, a moderately straight street leads from the water-side to each gate of the city on the s. front, and is more or less prolonged through the interior. Many of the streets are devoted to distinct trades; thus, there is 'Carpenter' street 'Apothecary' street, etc. The joss-houses, chiefly Buddhist temples, are said to be 124 in number. The largest of these, on Honam Island, covers seven acres, and has 175 priests attached. It is called *Hae Chwang Sze*, or 'The Temple of the Ocean Banner.' Another famous structure is 'The Temple of the Five Hundred Gods,' in the w. suburbs. There are also several many-storied towers or pagodas, a Mohammedan mosque, founded about A.D. 850 by the Arabian voyagers, who then were accustomed to visit Canton a foundling-hospital, an English and an American missionary hospital. Streets of wooden houses were formerly on the river side, but these were swept away during the late quarrel with Yeh; and one large site that they occupied was walled in for the purpose of erecting new foreign factories, the old ones having been totally destroyed by fire. A very remarkable example of life upon the water is the boat-town of Canton. The *climate* of Canton may be pronounced healthful, though the heat from June to Sep. is oppressive, and the thermometer sometimes, though rarely, stands at 100° in the shade. In ordinary years, the winter minimum is 42°, and the summer maximum 96°. The n.e. monsoon commences in Oct., and is the prevailing wind till March, when the s.w. monsoon sets in. Its average temperature is 70½° F., and the annual fall of rain 70.625 inches. The Cantonese are notorious for their turbulence and hatred of foreigners, and the European factories have more than once been attacked by infuriated mobs, who were kept at bay only by force of arms. This hostility may, however, be greatly due to the baneful influence of those in power; for here the government of the mandarins of the present Manchu

Tartar dynasty appears to have reached its maximum of corruption and barbarity, and was fitly represented by the notorious Yeh, late gov.-gen. of Kwang-tung and Kwang-se. The author of *Twelve Years in China* gives some startling facts, illustrative of mandarinic rule in this part of China. After the defeat of the Triad rebels, who besieged Canton 1844–5, it is estimated that 1,000,000 of people perished in the province.

The admirable situation of Canton for traffic explains how, from an early period, it was a favorite port with foreign merchants. The Arabs made regular voyages hither as early as the 9th c. The Portuguese found their way to it in the 16th c., and were followed by the Dutch a hundred years later. These in turn were overtaken and supplanted by the English before the close of the 17th c., and an immense trade was carried on by the agents of the East India Company. Their monopoly ceased 1834, Apr. 22. Since that date the proceedings of the Canton government officers have originated two wars with the British. The city was captured by the allied French and English forces 1857, Dec., and continued to be garrisoned by them till 1861, Oct.: see China. After the treaty of Nankin (signed 1842, Aug. 29) Canton was known as one of the five ports; Amoy, Foochow, Ningpo, and Shanghai also having been opened to foreign commerce.

The chief exports from Canton are tea, silk, sugar; the chief imports, raw cotton, piece-goods, opium, metallic wares, etc. 'War and rebellion' (say the authors of the *Treaty Ports of China and Japan*, Lond. and Hong-kong, 1867), 'the opening of Hankow as a shipping port for tea, and, above all, the proximity of Hong-kong and Macao to the delta of the Canton river, with its unrivalled facilities for smuggling, have robbed Canton of the pre-eminence it so long enjoyed in commercial prosperity,' but it still carries on a large traffic. Pop. of city (1901) is estimated to be about 850,000.

CANTON, John, English electrician: b. Stroud, 1718, July 31; d. 1772, March 22. He settled as a schoolmaster in London, and was elected a Fellow of the Royal Society in 1749. He invented an electroscope and an electrometer; originated experiments in induction; was the first to make powerful artificial magnets; and in 1762 demonstrated the compressibility of water.

CANTON, William, English writer: b. Isle of Chusan, China, 1845, Oct. 27. He was educated in France for the Roman Catholic priesthood, but decided upon a secular career and was for many years on the staff of the Glasgow *Herald*. Since 1890 he has been sub-editor of the *Contemporary Review* and manager of the London publishing house of Isbister & Company. He is author of *A Lost Epic and Other Poems* (1887); *The Invisible Playmate*, a strikingly original piece of work (1894); *W. V., Her Book and Various Verses* (1896); *The Invisible Playmate, and W. V., Her Book* (with final chapter) (1897); *A Child's Book of*

Saints republished in the United States as *W. V.'s Golden Legend* (1898); *Children's Sayings* (1900); *The Comrades, Poems, Old and New* (1902); *The History of the British and Foreign Bible Society* Vols. I. and II., (1903); *The Story of the Bible Society* (1904); *Little Hands and God's Book* (1904); etc.

CANTONNÉE, *kăng-to-nā'*, in Heraldry: location of a cross when between four other objects, e.g., scallop shells.

CANTONI, *kân-tō'nē*, CARLO, Italian philosopher: b. Gropello, 1840. He studied law and philosophy at Turin, and philosophy at Berlin and Göttingen (under Lotze). He was professor at the lyceum at Turin, and in Milan; since 1878 he has been professor of philosophy at the University of Pavia. In his philosophical theory he agrees in general with Kant. He wrote: *G. Battista Vico, studii Virtu e Comparazione* (1867); *Corso Elementare di Philosofia* (1870); *Guiseppe Ferrari* (1878); *Emanuele Kant* (1879–84).

CANTON'MENT, the district in which troops are quartered when they are not collected into a camp, but detached and distributed over the neighboring towns and villages. The object of sending troops into cantonments is to be able to concentrate them as quickly as possible on one spot, when circumstances do not admit of a camp being formed, or do not render it advisable to form one. In India the permanent military stations erected in the neighborhood of the principal cities are so called.

CAN'TOR: see PRECENTOR.

CANTRIP, n. *kăn'trĭp*, or CAN'TRAP, n. *-trăp* [Gael. *cean-drip*, a great and mischievous trick—from *ceann*, the head, the chief; *drip*, a snare which traps its author]: in *Scot.* and *OE.* a magic charm; an incantation; a mischievous trick.

CANTU, CESARE, *chā-zâ'-rĕ kân'too*, Italian historian, poet and philosopher: b. Brisio, 1805, Sept 5; d. 1895, Mar. 11. He was educated at Sondrio in the Valtellina, where he taught belles-lettres at a youthful age, resided afterward in Como, and next at Milan until 1848. One of his earliest works, entitled *Ragionamenti sula Storia Lombarda nel Secolo XVII.* (*Lectures on the History of Lombardy in the 17th Century*), appeared in a second edition in 1842–4, and contained liberal ideas that brought upon the author the animadversion of the Austrian government, which condemned him to a year's imprisonment. During his confinement he composed a historical romance, entitled *Margherita Pusterla* (1845), which became very popular. His great work, on which his reputation will chiefly rest, *Storia Universale* (*Universal History*), appeared first in 1837, at Turin. It has since been revised and reprinted at Palermo and Naples, and translated into German. A French translation by Aroux and Leopardi, was published in Paris in 1843. Other works of his are: *Storia degli Italiani* (1854); *The Last One Hundred Years* (1864); *The Italian Heretics* (1866–8).

CANTURIO, *kân-tō'rĭ-o*, or CANTU', *kân-tō'*: town of n. Italy, 5 m. s.e. of Como, in the midst of a rich district; has a church with an elegant tower, which served as a beacon during the middle ages, and manufactures of iron-wares. Pop. 5,500.

CANTY, or CANTIE: see under CANT 1.

CANULA, n. *kăn'ū-lă* [dim. of L. *canna*, a reed]: a tube used by surgeons for drawing off fluid from a part of the body.

CANUN, or KANOON, n. *kăn-ôn'* [Turk]: an instrument strung with cat-gut, in form like a dulcimer, with which the women in the harem accompany their singing. The sound is brought out by means of plectra-thimbles made of tortoise-shell pointed with cocoanut wood, and worn upon the ends of the fingers.

CANUTE, *ka-nūt'*, or CNUT, *knôt*, King of England: d. 1035 or '36: succeeded to the rulership of the Danes in England on the death of his father, Swein or Sweyn, and was by them proclaimed king. On the death of Ethelred, he shared the sovereignty with Edmund Ironside, who ruled over the south, while C. was monarch over the north of England. The sudden decease or assassination of Edmund made C. sole ruler 1017, and he reigned till his death. His rule was marked at first by cruelty, but when all who were likely to interfere with his power had been disposed of, he showed mildness and justice, combined with talent and judgment. The Anglo-Saxons, whose complete subjugation he had effected, did not feel their chains; they had experienced no such good government since the time of Alfred and Athelstane. He was easily accessible to all his subjects; and won the hearts of the people by his love for song and ballad, and his liberal patronage of gleemen. One verse of an English song written by C. is still extant. As soon as English affairs were settled, C. superseded his brother Harold as king of Denmark; and in 1028 he extended his dominion over Norway—becoming thus one of the most powerful princes of Europe. In his latter years he was devout.

CANVAS, n. *kăn'văs* [F. *canevas*, canvas—from It. *canavaccio*, canvas, a piece for embroidery: L. *can'nabis;* It. *cannevo*, hemp]: a coarse cloth made of flax or hemp, used for tents, sails, painting on, etc.; in a *ship*, the sails are called the *canvas* (see SAIL: SAILCLOTH): ADJ. made of canvas. CANVASS, v. *kăn'văs* [a metaphorical meaning taken from sifting a substance through *canvas*]: to discuss and sift, as a subject or policy; to examine into, to solicit votes or interest; to make interest in favor of: N. a close inspection into; discussion; debate; a seeking; a solicitation. CAN'VASSING, imp.: N. the act of one who canvasses. CAN'VASSED, pp. *-văst*. CAN'VASSER, n. *-văs-ẽr*, one who solicits, as a vote.

CAN'VAS, for Artists' Use: principal material upon which oil-paintings are made. Two kinds are prepared of which the best is called *ticking*. Before it is put into the artist's hands, it is usually *primed*, or grounded (see GROUND) of a neutral gray, or other tint, as he may direct. Certain sizes of C. being in greater request than others, are

kept ready stretched on frames. Those used for portraits are known by the names of *kit-cat*, which measures 28 or 29 inches by 36; *three-quarters*, 25 by 30 inches; *half-length*, 40 by 50; *Bishop's half-length*, 44 or 45 by 56; *Bishop's whole length*, 58 by 94.

CANVAS-BACK, *kăn'vas-băk* (*Anthya Vallisneria*): duck of the family *Fuligulinæ*, valued for its flavor above all other water fowl, and considered by epicures to afford a dish unsurpassed. It is peculiar to N. America, and found chiefly on the bays and estuaries of the sea, though it associates freely with the *Anatinæ* or river ducks. The male is about 22 in. long, with a wing 9½ in.; its head and neck are red; breast and back black and white; wings, tail, and legs, gray, slate-color, and brown. The female is somewhat smaller, and less highly colored. This duck breeds at lat. 50° and further n., and comes s. in Nov. Its excellence as food is attributed to the wild celery on which it feeds in Chesapeake Bay, about the mouth of the Potomac; when found elsewhere, its flesh is not better than that of other wild fowl, and inferior to that of the red-head. It flies high and rapidly, and is usually shot on the wing from behind screens. The breast feathers are so thick and matted as often to resist ordinary shot. These birds have much curiosity, and will swim in numbers toward any unusual object on the shore; because of this habit they are often killed through long screens, dogs, and 'toling,' a method abhorred by true sportsmen.

CANY, a. *kā'nĭ* [see CANE]: full of canes; consisting of canes.

CANZONET, or CANZONETTE, n. *kăn'zŏ-nĕt'*, or CANZONÉ, *kăn-zō'nā* [It. *canzonetta*, a little song—from *canzona*, a song: L. *cantĭōnem*, a song—from *canto*, I sing]: one of the oldest and most prized forms of the Italian lyric. The word is borrowed from the Provençals, whose *cansôs* or *chansôs*, however, were not restricted to any precise form, but were simply verses intended to be sung. The Italian writers first attempted to regulate the wayward and arbitrary character of the Provençal *cansôs;* Dante, and subsequently Petrarch, being especially successful. The *Canzone Petrarchesca* or *Toscana* was any considerable lyrical poem, composed of stanzas exactly corresponding to one another in number of lines, measure, and position of rhymes, and which customarily closed with a short stanza. About the end of the 16th c., the Italian writers began to deviate from the strict form of the Petrarchian canzone. Torquato Tasso and Chiabrera are the most notable names in the new movement. The most of the canzones of the latter—called by their author *canzonette*—are written in short lines and stanzas, the position of the rhymes being also completely arbitrary.

CAOUTCHOUC: see INDIA RUBBER.

CAP, n. *kăp* [AS. *cæppe*, a cap: Sp. *capa;* It. *cappa;* F. *chape*, a cover—from mid. L. *cappa*, and *capa*, a hooded cloak]: a cover in general; a cover for the head; the top or highest part; a cover for the head as a mark of some office

or dignity; in *ship-building*, a strong, thick block of wood fixed near the top of each mast; it has a hole to receive the upper end of the lower mast, and another to receive the lower end of the topmast, with eyebolts to aid in hoisting the topmast. There is also a C. of smaller size at the junction of the topmast and the top-gallant-mast. When made of iron the C. is called a *crance:* V. to cover the top end or orifice; to uncover as a mark of reverence or civility; to render complete; to invest with official distinction; in *Scot.*, to complete the admission to academical honors by the ceremony of capping; to contend with or surpass a rival in quoting texts or making verses. CAP'PING, imp. CAPPED, pp. *căpt.* CAP-A-PIE, ad. *kăp'-ă-pē'* [F. *cap-à-pie*—from L. *căput*, the head; *pedem*, a foot]: from head to foot; all over, as *armed cap-à-pie.* CAP'FUL, n., CAPFULS, n. plu., a small quantity, used by sailors when speaking of the wind. CAP-OF-MAINTENANCE, a cap carried before the kings of England at their coronation; worn by noble and royal personages 'on certain state occasions.' CAPSHEAF, the top sheaf of a stack of corn. TO SET ONE'S CAP AT, to take measures to gain the affections of a man on the part of a woman. CAP IN HAND, with obsequious submissiveness in order to obtain a favor from a great man. CAP OF LIBERTY, a small red cap worn by a former slave as a token of his freedom. PERCUSSION-CAP: see PERCUSSION.

CAPABLE, a. *kā'pă-bl* [F. *capable*—from mid. L. *căpābilis*, that may be taken or comprehended—from L. *capĭō*, I take]: able to contain or receive; having the requisite mental, moral, or physical ability; qualified for; able to understand; susceptible. CA'PABLENESS, n. *-bl-nĕs*, the quality of being capable. CA'PABIL'ITY, n. *-bĭl'ĭ-tĭ*, the quality of being able or qualified for. CAPACIOUS, a. *kă-pā'shŭs* [L. *căpācem*, that can hold much]: roomy; large; that will hold or take in much; extensive. CAPA'CIOUSLY, ad. *-lĭ.* CAPA'CIOUSNESS, n. power of holding or receiving much. CAPACITATE, v. *kă-păs'ĭ-tāt* [L. *capacĭtātem*, capacity]: to qualify; to enable. CAPAC'ITATING, imp. CAPAC'ITATED, pp. CAPAC'ITA'TION, n. *-tā'shŭn.* CAPAC'ITY, n. *-ĭ-tĭ*, the power of containing; extent of room or space; the power of receiving instruction; ability; profession or occupation. —SYN. of 'capable': qualified; fitted; able; competent; efficient; effective; skilful;—of 'capability': skill; ability; capacity; cleverness; talent; genius; faculty; efficiency.

CAPACITY, BATTERY: the ability of an electric battery to give out a certain quantity of electricity—usually computed in ampere hours—before the chemicals become exhausted and require replenishing. In the Storage Battery, the ampere hours out-put it is capable of discharging at a given rate before re-charging is necessary. See BATTERIES, ELECTRIC and BATTERY, STORAGE.

CAPACITY, ELECTRO-STATIC. The quantity of electricity which a given electrical condenser is able to absorb at a pressure of one volt between the condenser terminals. This refers to any two bodies between which

a charge may exist. See CONDENSER, ELECTRICAL AND ELECTRICITY, PRINCIPLES OF.

CAPACITY, LEGAL: such a condition of individuals, in regard to their natural qualities and actual position under the constitution of the country, as fits them for the application of the laws, civil and criminal. Generally speaking, all persons have this legal capacity excepting *aliens*, persons *attainted, convicts, insane* persons, and to some extent also *infants, femmes coverts*, or married women, and persons under *duress;* see these titles. See, also, CONVEYANCE: CONTRACT: PLAINTIFF: PURSUER: DEFENDANT: SUIT.

CAPACITY, SPECIFIC INDUCTIVE. The property of dielectrics which when used as the separators between oppositely charged bodies produce an electrostatic capacity of a different value from that which would exist if the charged bodies were separated by air, which is taken as the unit. Following is a table of specific inductive capacities of various dielectrics, which in electric static formulæ are denoted by the letter K.

	K.		K.
Air	1.00	Sulphur	2.88 to 3.21
Paraffine	2.47	Shellac	2.95 to 3.73
Rubber	2.34	Gutta-percha	4.2
Resin	2.55	Mica	5.00
Ebonite	2.76	Flint Glass	6.57 to 10.1

CAP-A-PIE, adv. *kăp ă pē*, [O. Fr. *de cap à pie*]: from head to foot; completely.

CAPARISON, n. *kă-păr'ĭ-sŭn* [F. *caparaçon*, caparison —from Sp. *caparazon*, carcass of a fowl, cover of a saddle —from Sp. and mid. L. *capa*, a cloak]: an ornamental cover laid over the saddle of a horse: V. to cover with an ornamental cloth, as a horse; to deck; to dress out superbly. CAPAR'ISONING, imp. CAPAR'ISONED, pp. *-sŭnd;* in *heraldry*, a war-horse completely furnished for the field is said to be caparisoned.

CAPE, n. *kāp* [F. *capote*, a greatcoat—from *cape*, a hooded cloak (see CAP)]: a cover hanging from the neck over the back and shoulders; the neck-piece hanging over a cloak; a short, loose cloak.

CAPE, n. *kāp* [It. *capo;* F. *cap*, a promontory, a headland—from L. *caput*, the head]: any portion or point of land projecting into the sea beyond the general line of the shore. On a low sandy coast, a cape generally forms an obtuse angle, being merely a change in the trending of the land. On rocky shores, capes usually form acute angles, and are called points, or if high, headlands or promontories

CAPE ANN: e. point of Essex co., Mass., at n. end of Massachusetts Bay, 31 m. n. e. of Boston; lat. 42° 38′ n., long. 70° 34′ w. It is a rocky headland of syenite, of which quarries are worked for building purposes, close to the water. The name is given to the whole peninsula forming the town of Rockport and part of Gloucester. Near the end of the cape is the small harbor of Pigeon

Cove, where coasting vessels may take refuge from the prevalent n.e. storms. Two fixed lights, 500 yds. apart, on Thatcher's Island, are known as the Cape lights.

CAPE ANN SETTLEMENT, the first within the limits of the Massachusetts Bay territory. In 1622, the New England Company, to push the settlement of its grant and give it some value, divided the land in severalty among its members. The region about Cape Ann fell to Edmund, Lord Sheffield, who sold a patent for it in 1624 to Robert Cushman and Edward Winslow of the Plymouth colony. They found some English hunters and fishers who had been there since the year before; these acknowledged the rights of the Plymouth people, and the two parties planted and fished amicably; but shortly after a London vessel which had taken up the quarrel of the firebrand, Rev. John Lyford, seized the Plymouth men's fishing stage. Miles Standish came up from Plymouth to settle the trouble by force, but against his wish, the settlement compromised the matter by the crew agreeing to build them another stage In 1624 Winslow's company sold the site of Gloucester to the 'Dorchester Adventurers,' an unincorporated English joint-stock company recently formed. These had anticipated the bargain by sending out a band of settlers the fall before, with live stock, implements, etc., and they made Thomas Gardner overseer. The attempt was unsuccessful, and in 1625 the Dorchester company engaged Roger Conant, then at Nantasket with Lyford, to be governor, Lyford to be minister. But the next year the 'Adventurers' dissolved, and most of the settlers went home; the few remaining ones, however, removed to'Nahumkeike' (Naumkeag), where they founded Salem.

CAPE BAB-EL-MANDEB: see BAB-EL-MANDEB.

CAPE BIANCO, *be-ân'ko:* extreme n. point of Africa, on the Mediterranean coast; lat. 37° 20′ n. long. 9° 48′ e.

CAPE BOEO, *bo-ā'o:* w. point of Sicily, 1 m. from Marsala. The first Punic war closed by a naval victory of the Romans over the Carthaginians off this point.

CAPE BON, or RAS ADDER, *râs âd'der:* point of entrance of the Gulf of Tunis, Africa.

CAPE BRETON, *brĕt'on:* rocky island of irregular form in British N. America, between n. lat. 45°—47°, w. long. 59° 30′—61° 30′; 4,376 sq.m. It is separated from the peninsula of Nova Scotia by Chedabucto and St. George's bays and the Gut of Canso. Portions of its coast are bold and impressive, and it has much picturesque scenery. Its principal exports are pine, oak, birch, maple, fish, and coal. Though the island produces maize and other grains yet it depends for breadstuffs chiefly on the United States. Originally a French possession, it was taken by the English 1745; but being subsequently restored to France it was again captured in 1758, and ceded in 1763. After having been for a time a distinct colony, it now forms part of the province of Nova Scotia. The towns are Sidney, Arichat, and Port Hood, the once famous Louisburg, stripped of

its fortifications, having become merely a village. Pop. about 84,500.

CAPE CANAVERAL, *kă-năv'ér-ăl:* in Volusia co., Fla., on the Atlantic coast: lat. 28° 27′ n., long. 80° 33′ w. It is nearly surrounded by dangerous shoals; a revolving light, 139 ft. above the sea, stands on the n.e. side.

CAPE CHARLES: s. extremity of Northampton co., Va., and of the 'eastern shore', separating Chesapeake Bay from the Atlantic, and 12 m. n. of Cape Henry; lat. 37° 7′ n., long. 76° w. On Smith's Island, n.e. of it, is a lighthouse with a revolving light.

CAPE CLEAR: on s. side of Clear Island, off the s. coast of Ireland, co. Cork. The island is 31 m. long and 1 m. wide, and has a coastguard station, a telegraph station, and a lighthouse whose light is 455 ft. above the sea, in lat. 51° 26′ n., long. 9° 29′ w. Another lighthouse, whose light is 148 ft. high, stands on Fastnett rock, 3½ m. w. of the cape. The cape itself is a rocky promontory, 400 ft. above the sea, and is the point of British land usually sighted first by vessels sailing from America to English ports.

CAPE COAST CASTLE: chief settlement of Great Britain in North or Upper Guinea; lat. 5° 5′ n., long. 1° 13′ w. The place, as its name implies, is defended by the great castle near the water's edge, and by three small forts on the hills behind. C. C. C. was the capital of the gold coast until 1875; when Accra was made the seat of government, as being more healthful. Pop. 10,000.

CAPE COD: properly the n.w. point of the narrow strip of land, which, with a length of 65 m., curves outward to the e. and n. from the southern Massachusetts coast, and forms the s.e. boundary of the great Cape Cod Bay. The whole peninsula also is known as Cape Cod; it was discovered by Gosnold, 1602. Race Point, at the n. extremity, is marked by a revolving light 155 ft. above the sea; lat. 42° 3′ 40″ n., and long. 70° 14′ 48″ w. It has been proposed to cut the neck of the peninsula by a canal leading to the head of Buzzard's Bay.

CAPE COLONY: see CAPE OF GOOD HOPE.

CAPE DISAPPOINTMENT, or CAPE HAN'COCK: s.w. point of Washington Terr., in Pacific co., at the mouth of Columbia river; lat. 46° 16′ n., long. 124° 2′ w. It has a lighthouse 40 ft. high, with a fixed white light 232 ft. above the sea.

CAPE ELIZ'ABETH: township of Cumberland co., Me., near Portland. It takes its name from the cape at its s. end, which is 50 ft. above the sea; lat. 43° 34′ n., long. 70° 12′ w. Here are two lighthouses, 300 yds. apart; the lights, one fixed, one revolving, are 140 ft. above the sea. The town, which is almost a suburb of Portland, is a summer resort, and contains a state reform school, 7 churches, etc. Pop. (1890) 5,459; (1910) 900 (part taken to form South Portland since 1890).

CAPE FAREWELL: s. extremity of Greenland; a precipitous headland on a small island of the same name; lat.

59° 49′ n., long. 43° 54′ w. It has one of the most tumultuous situations on the globe; storms are frequent, a strong current sets round it from e. to w., and it is surrounded from Jan. to Sep. by a body of ice extending sometimes 100 m. out to sea.

CAPE FEAR: s. extremity of N.C., and of Smith's Island, Brunswick co., off the mouth of Cape Fear river; lat. 33° 52′ n., long, 78° w. A dangerous shoal, called the Frying-pan, is close by, and a lighthouse stands thereon, 1 m. from the cape.

CAPEFIGUE, *kâp-fēg′*, Baptiste Honoré Raymond: 1802–1872, Dec.; b. Marseille; French publicist and historian. He studied law at Aix, and in 1821 went to Paris, to complete his juridical course, but soon betook himself to journalism and authorship. He held a post in the foreign office until 1848. This, however, did not interfere with his amazing activity. Besides contributing extensively to many of the Parisian journals, he 'manufactured' not less than a hundred of volumes of history—not, indeed, intrinsically valuable, but indicating wonderful facility in composition. The best is the *Histoire de la Restauration* (3d ed. 1842). *Les Reines de la Main Gauche* (15 vols.) appeared in 1858–64.

CAPE FLAT'TERY: n.w. extremity of Washington Terr., in Clallam co., separating the strait of Juan de Fuca from the Pacific. A small lighthouse stands on Tatoosh Island, ½ m. off, in lat. 48° 23′ n., long 124° 44′ w. Except for Alaska, this is the westernmost point of the United States.

CAPE FLORIDA, *flŏr′ĭ-da:* s. extremity, of Key Biscayne, off the s.e. point of Fla. The island is 7 m. long and 2 wide, and has on the w. end in a grove of cocoa-nut trees a lighthouse with a fixed white light; lat. 25° 40′ n., long. 80° 9′ w. It was burned by the Indians in the Seminole war.

CAPE GATA, *gâ′tâ,* or Cape de Gatte (Sp. *El cabo de Gata*): s.e. extremity of Spain, on the coast of Granada, bounding the Bay of Almeria on the e. It is a rocky promontory, 13 m. wide and 24 in circuit, and was once a resort of Moorish pirates. Here is the ancient *Promentorium Charide-mi,* the Moorish Kheyran, composed of crystals, spars, and agates. It is called the port of silver, *el puerto de la plata.* The prevalent high winds called forth a sailors' saying, 'At Cape de Gatte take off your hat.'

CAPE GIRARDEAU, *jē-râr-dō′:* city and township of Cape Girardeau co., Mo., on the Mississippi, 120 m. s.s.e. of St. Louis. It is the shipping-place of a fertile region, and exports cotton, plows, and mineral paints. It has St. Vincent's (Rom. Cath.) College, a normal school, a girls' seminary, 7 churches, and 4 newspapers. Pop. (1880) city 3,889; (1890) 4,297; (1900) 4,815; (1910) 8,475.

CAPE HAT'TERAS: dangerously low point of the coast of North Carolina; lat. 35°14′ n., long. 75°30′w. It forms the eastern extremity of the insular banks of the same

name, projecting to within a few miles of the Florida stream, and marking the spot where the coast line abruptly turns from n.e. to due n. Frequent gales and storms add to the dangers from shoals and currents. The shore region is barren and desolate. Near the cape is a light 192 ft. above the sea.

CAPE HAYTIEN, *hā'te-ĕn* (formerly called *Cape Français* and *Cape Henri*): seaport town on the n. coast of the island of Hayti; lat. 19° 40′ n., long. 72° 54′ w. It is pleasantly situated on a small bay, partly encircled by hills, has wide and well-paved streets, and some handsome squares. A great portion of it, however, is in ruins, the effects of the revolutionary wars at the end of last century. Safe anchorage is found within the harbor, which, however, is rather difficult of access. C. H. has considerable trade with the United States. Pop. est. (1901) 29,000.

CAPE HENLOPEN, *hĕn-lō'pen:* at the s. extremity of Delaware Bay, in Sussex Co., Del.; 13 m. s.s.w. from Cape May; lat. 38° 46′ n., long. 75° 6′ w. It has a stone lighthouse with a fixed white light, 128 ft. above the sea. The name is Dutch, and means to run in or enter.

CAPE HEN'RY: at the s. extremity of Chesapeake Bay, in Princess Anne co., Va., 12 m. s. of Cape Charles; lat. 36° 55′ n., long. 76° w. It has a fixed light, 120 ft. above the sea.

CAPE HORN, *hawrn*, or HOORN, *hōrn:* most southerly point of America, terminating an island of its own name, in the archipelago of Terra del Fuego; lat. 55° 58′ 40″ s., long. 67° 16′ w. It has a perennially antarctic climate, and is merely a detached link, bare and rugged, of the chain of the Andes. It was discovered 1610, by Schouten, a native of Hoorn in Holland, about 90 years later than the Strait of Magellan, which is about 200 m. n. of it, and since then the course of sailing vessels has been round the cape instead of through the strait. Of late years, however, steam vessels find the strait preferable.

CAPE LA HAGUE, *lâ hāg* or *lâ âg* or *lâ hâg:* promontory of France, the n.w. extremity of the peninsula of Cotentin, in the dept. of Manche. It juts out into the English channel, opposite the island of Alderney, and about 16 m. n.n.w. of Cherbourg, and 50 m. s. of St. Alban's Head in Dorsetshire.

CAPE LA HOGUE: often confounded with Cape la Hague, is on the e. side of the same peninsula. Here the united English and Dutch fleets defeated the French 1692.

CAPELAN, *kăp'e-lan* (*Mallotus Grœnlandicus*): small fish of the family of *Salmonidæ*, extremely abundant on the coasts of Newfoundland, and much used as bait in the cod-fishery. It is also, in a dried state, an article of commerce. Its flavor, which is very agreeable, suggests its alliance with the herring rather than the salmon family. It is nearly allied to the smelt, but the teeth are smaller and more numerous. It is the only known species of its genus.—Shoals of capelins arrive periodically on the coast

of Newfoundland, the vast numbers changing the very color of the sea. Spelled also CAPELIN.

CAPE LIVERPOOL: a headland of the entrance to Lancaster sound, British N. America, s. side.

CAPE LIVERPOOL: headland at the inlet of Liverpool bay, in the Arctic ocean, N. America, s.w. of Cape Bathurst; lat. abt. 70° n., long. 129° west.

CAPELLA, *ka-pĕl'la:* bright star of the first magnitude, on the left shoulder of Auriga. C. is also called Capra or the *She-goat,* a name also sometimes given to Capricorn.—The poets fable C. to be Amalthea's goat, which suckled Jupiter in his infancy.

CAPELLA: see A CAPELLA.

CAPELLA, *kâ-pel'lâ,* GALEAZZO FLAVIO CAPRA: 1487–1535; b. Milan: Italian historian. He was sec. of state to Francis Sforza, Duke of Milan, and orator to the emperor Maximilian and subsequently to Charles V. Among his writings are a *History of the Wars of the Milanese from* 1521–1530, and a *History of Francis Sforza* (1535). He was intrusted with important diplomatic missions.

CAPELLA, *ka-pĕl'la,* MARTIANUS MINEUS FELIX: learned author in the second half of the 5th c.; born in Africa, but where is not ascertained. Of his life nothing whatever is known. The work which has preserved his name to posterity is the *Satiricon,* a kind of encyclopædia, highly esteemed during the middle ages as a work of reference. It is written in a medley of prose and verse, and is full of curious learning, but has no literary value; the style has all the bombastic pomp of the African school of later Latinists. It comprises nine books. The first two consist of an allegory, *The Nuptials of Philology and Mercury,* while the remaining seven are devoted to the 'liberal arts,' grammar, dialectics, rhetoric, geometry, arithmetic, astronomy, and music. The first edition of the *Satiricon* appeared 1499, under the care of Franciscus Bodianus; the best in 1836, under the care of U. F. Kopp.

The book on astronomy is remarkable as containing a hint of the true theory of the solar system. Mercury and Venus are there declared to move round the *sun,* and not round the *earth;* and their relation to these bodies is properly explained. Now, as Copernicus knew C., and quotes from him, it is not unlikely that he derived the first idea of his doctrine from this writer.

CAPE LOOK'OUT: s. extremity of an island inclosing Core Sound on the coast of Carteret co., N. C., 85 m. s.w. of Cape Hatteras; lat. 34° 37′ n., long. 76° 31′ w. It divides Onslow Bay from Raleigh Bay. It has a lighthouse with a fixed white light, 100 ft. above the sea.

CAPE MATAPAN, *mâ-tâ-pân':* s. extremity of Greece, extending into the Mediterranean; lat. 36° 23′ n., long. 22° 29′ e. The ancient name *Tænarum* or *Promontorium Tænarium* applied not only to this headland but to the peninsula; both were sacred to Neptune, the remains of whose temple, near the cape, are still visible. It was a sanctuary

for the Greeks. Here was a cavern, supposed to be one of the entrances of Hades, and here dwelt a fabulous serpent, killed by Hercules.

CAPE MAY: s. extremity of N. J., in Cape May co., at the entrance of Delaware Bay; named from Cornelius Jacobse May, who visited this region 1623, and called Cape Henlopen Cape Cornelius. At its s.w. point is a lighthouse with a revolving light, 152 ft. above the sea, lat. 38° 55′ n., long. 74° 57′ west.

CAPE MAY, or Cape Island, or Cape City: city of Cape May co., N. J., occupying an island of some 250 acres, separated from the mainland by a small creek. It has long been famous as a watering-place, having a noble beach over five m. long, and bathing facilities probably unsurpassed in the world. There are many hotels, some of great size, and numerous boarding-houses and private cottages. By the West Jersey railroad it is 81 m. from Philadelphia; by the Delaware river and bay the distance is abt. 100 m. Steamboats run daily in the season. The town has two weekly newspapers. Permanent pop. 3,050.

CAPE MENDOCINO, *mĕn-dō-sē′nō:* w. point of Cal., in Humboldt co. It has an iron lighthouse, with a white revolving light, 428 ft. above the sea; lat. 40° 26′ n., long. 124° 23′ west.

CAPE NOME: a cape, city and center of a rich gold mining region, extending from the s. face of the peninsular projection of Alaska. The cape separates Bering Sea on the s. from Kotzebue Sound on the n., and ends on the w. at Cape Prince of Wales, the extremity of the North American continent. The Nome district as settled centers around the lower course of the Snake river, a winding stream which empties into the sea about 13 miles w. of Cape Nome proper. The first discovery of gold was made 1898, Sept., by a number of Swedes, who found it in the ravines and creeks. It was not until 1899, July, that the beach gold was discovered. In the middle of the following Oct. there were 5,000 inhabitants in Nome City, all living in tents on what before was barren shore. The rapidity of the development of Nome City has probably never been equalled. The region is entirely within American boundaries. Early prospecting indicated that it would rival the celebrated Klondike fields in richness. The Cape Nome region, 1901, yielded $7,000,000 in gold, and in the first ten months of 1902 the output was $5,008,980.

CAPE NORTH: promontory in the Arctic Ocean, noted as the most northerly point of Europe. It consists of a long stretch of steep rocks, jutting into the sea and reaching a height of 1,200 ft., the top showing a large area of table land and a series of picturesque pyramidal peaks. It forms the n. extremity of Mageröe Island, which is separated from the mainland of Norway by a narrow channel; lat. 71° 10′ 12″ n., long. 25° 46′ east.

CAPE OF GOOD HOPE: popularly regarded as the most southerly promontory of Africa, though it is half a degree n. of Cape Agulhas. The latter is merely a projection on a coast line, which diverges inconsiderably from a parallel; but the Cape of Good Hope is really the turning-point from s. to e. on the voyage from Europe to India. This celebrated promontory is in lat. 34° 22′ s., and long. 18° 29′ e., being the termination of Table Mountain, which, as it recedes toward the bay of its own name, rises from the height of 1,000 ft. above the sea to that of 3,582 ft. The Cape (for so it is called by way of eminence) was discovered and doubled by Diaz, a Portuguese navigator, as early as 1486—six years before Columbus, aiming at the same goal by a different route, led the way to America. But it was only in 1497 that Vasco da Gama realized the value of Diaz's discovery, by rounding it on his adventurous voyage from Lisbon to Calicut. The result was not merely to open a new channel for the traffic of the East, but also to transfer trading superiority from the republics of Italy to the states of western Europe.

CAPE OF GOOD HOPE: British colony, so called from the cape on its s.w extremity. It was established by the Dutch, 1652, some attempts at a settlement having been previously made by the Portuguese. The Dutch at first intended it as only an intermediate station between Hol land and their East Indian possessions, and occupied only a small tract of ground on the slopes of Table Mountain, with some portion of the adjoining flats; but they had in their neighborhood scattered tribes of improvident natives, singularly feeble of purpose, and incapable of organization on a large scale. The tide of immigration set in from Holland, and when the country was finally taken possession of by the British in 1806 (there having been a brief British occupation, 1796–1803) the Dutch had extended their dominion as far to the e. as the mouth of the Great Fish river, and from that point in a waving line across the country to the w., a little south of Orange river.

In entering upon the government of this large territory, the British found themselves face to face with a race of a totally different sort from that of the purposeless Hottentot—a people styled Kafirs, of the great Bantu stock, consisting of tall, athletic, finely-formed men, of warlike disposition, with incurable propensity to steal from any one not of their own tribe, particularly from a foreigner. The inevitable result was a succession of wars in 1812, 1819, 1828, 1835–6, 1846–7, 1851–2.

Cape Colony proper is bounded on the n. by the Orange river and the Kei. But of late the area of this British possession has been greatly extended by the annexation of districts northward. Of these successive annexations the most important are that of British Kaffraria (see KAFFRARIA) 1866; of Basuto-land, lying in the upper basin of the Orange river, 1868; of two vast districts across the Kei called Fingo-land and No-man's-land, now called Griqua-land East (q.v.), 1875; of Griqua-land West, 1876; and of the Transvaal (q.v.) 1877, restored to the Boers.

1881, though remaining under British suzerainty. The area of Cape Colony proper is 191,416 sq. m. Pop. (1891) 619,547. The area of the whole colony, with the newly incorporated districts (excluding the Transvaal), was (1891) 376,987 sq. m.; pop. est. (1901) 2,433,000.

The highest range of mountains within the colony is 9,000 ft. above the sea. The mountains keep at a distance from the coast line of from 30 to about 100 m., and receive different names in their course, such as the Stormberg, Sneeuwberg, Nieuwveld, Roggeveld, and Kamiesberg. Between this principal range and the sea on the e. there are two other ranges less continuous and regular.

South Africa being not far from the region of the trades, s.e. winds prevail, especially in summer; the only other wind is from the n.w., which prevails during the colder months. But whichever of these two winds predominates —the one bearing a supply of rain from the Indian Ocean, the other, less frequent, but more richly laden from a part of the Atlantic nearer the line than the country which it fertilizes—it fails to deposit its stores on the opposite side of the principal water-shed which crosses its path. Hence the curious fact of the transposition of seasons in the same latitude. As the harvest in such latitudes depends more on the supply of rain than anything else, people on one side of the country are reaping while those on the other are sowing and planting. Certain parts of the country are liable to long-continued droughts, because while very heavy rain-falls take place, the rain is confined to a particular part of the year. The country, however, is admirably adapted for the storage of water. In many places are the successive beds of dried-up lakes, with a narrow outlet at the lower ends, through which a periodic stream flows. By closing up this outlet artificial lakes or dams may be formed to almost any extent, and of unlimited number; and from the steepness of the slope, the lands lower down admit easily of being laid under water.

As regards minerals, the diamond fields are in Griqualand (q.v.), till recently beyond the limits of the colony, and in the Free State. In 1874, the lieut. of West Griqualand issued an order for the better management of diggings and mines of precious stones and minerals, in which he requires that miners shall have a certificate, dealers a license, and the mines be under official inspection. This ordinance created a great outcry of opposition by a large body of dealers; but it seems necessary that such protection should shield the weak and the the dealer who wishes to trade according to recognized law. The discovery of gold (1886) caused a rush to the Transvaal; coal is said to abound in the Stormberg mountains, but the only mineral which has greatly added to the wealth of the colony is the rich copper ore found in Namaqua-land.

There is in the colony almost a total lack of navigable rivers, but the system of railways is rapidly extending. In 1901 there was a mileage of about 8,000 m. open for traffic, the existing lines being mainly connected with three systems—the Western, starting from Cape Town;

the Midland, from Port Elizabeth; and the Eastern, which starts from East London. The railways all are the property of the government. Direct telegraphic communication with Europe was established 1879, by the E. African submarine cable from Aden to Natal, and thence by the land lines. The shipping at Cape Town is now secured by a breakwater and an extensive system of docks. Works are in progress at Port Elizabeth, East London, and the Kowie for protecting these also from the fierce s.e. winds.

This attractive country is at present occupied by an assemblage of varied races. The Portuguese were the first Europeans who landed here. The Dutch are probably still the most numerous, notwithstanding the exodus to the Orange River Colony, prompted by the slave question. Next in number are the English, by whom some parts of the country, particularly in the east, are occupied almost exclusively. The French also are largely represented, many refugees having settled in it subsequently to the revocation of the Edict of Nantes, but they are now nearly absorbed in the Dutch population. They were at first located principally in the w., where they introduced the culture of the vine, but their names are now found in amost every part of the land. There is also a considerable importation of Germans, who have been settled on the frontiers adjoining the Kafirs for defensive purposes. As regards the colored inhabitants, large numbers of Kafirs have been retained in the districts which they formerly occupied, and others have come into the country as shepherds and servants. There is a large number of people of Malay origin in and around Cape Town, and in towns on the e. coast, who gain a livelihood as fishermen, porters, and in the more laborious sorts of skilled labor. There are a few Mozambiqueres and Hottentots, besides a number of half-castes, to whom the name Africander properly belongs.

The constitution of the country, after several changes, was fixed in its present form, by an act passed by the colonial legislature 1872, which provides for responsible government. The confederation of the s. African colonies, so as to include Natal, has been long aimed at, but not yet accomplished. The organized part of the Cape Colony is divided into 7 provinces, and between 30 and 40 districts. There are two elective chambers, elected by colonists having a certain property qualification or a specified annual income. The legislative council consists of 23 members, some elected for 10 and some for 5 years. The house of representatives numbers 95 members, chosen for 5 years. The British crown, which appoints the gov., retains the right of veto on all legislation. The administration is vested in an executive council, composed of the gov., the lieut. gov., and a ministry of 5 members—the colonial sec., the attorney-gen., the treas. gen., the commissioner of crown lands and public works, the sec. for native affairs. The supreme court, which

has its sittings in Cape Town. has two judges besides the lord chief-justice. Another court holds its sittings in Graham's Town, in which there are two judges only, but there lies an appeal to the supreme court. In other parts of the colony, justice is administered by the judges going on circuit. A colonial university has recently been founded.

Wool is the staple product of the colony; ostrich farming and the culture of the vine are carried on. The following tables show the exports and imports of the colony:

	Imports.	Exports.
1886	£3,970,811	£7,306,538
1887	5,771,543	7,922,957
1888	7,013,885	8,964,449
1889	10,841,454	9,829,900
1901	21,416,160	10,719,779

The Cape Colony is not exceptional in showing a decline in imports and exports in 1877; but the insecurity caused by the troubles ending in the Zulu war of 1879 hindered the prosperity of the colony. The official tables include in the returns of revenue also the loans raised by the government; the increase since 1873 is accordingly not to be regarded as normal. Public debt 1901, Jan. 1, £31,393,435.

	Revenue.	Expenditure.
1870	£831,211	£795,695
1873	2,078,220	2,159,658
1875	2,246,179	2,272,275
1880	3,541,720	3,742,665
1901	9,072,775	10,350,000

CAPE ORTEGAL, *ōr-tā-gâl':* n.w. extremity of Spain, prov. of Coruña, lat. 43° 45′ n., long. 7° 56′ w. It is a rugged promontory extending into the Bay of Biscay, or dividing it from the Atlantic, in the roughest and most barren part of the Spanish coast.

CAPE PALMAS, *păl'mŭs* or *pâl'mâs:* s. extremity of Liberia, on w. coast of Africa; lat. 4° 22′ n., long. 7° 44′ w.; a high point with a lighthouse. The name is also applied to that region, which, under the appellation of Maryland, is one of the states of the Liberian republic. Colored emigrants were sent there, 1834, by the Md. Colonization Soc. The American Prot. Episc. Church supports a missionary bp. of C. P. and parts adjacent, Samuel D. Ferguson, D.D., consecrated 1885.

CAPE PRINCE OF WALES: westernmost point of the American continent, in Alaska, on Behring Strait just below the Arctic circle; lat. 66° n., long. 168° w. It ends in a peaked hill, and is dangerous to navigators by reason of a shoal stretching northeast.

CAPER, v. *kā'pėr* [L. *caper*, a goat: It. *capriolare*, to leap about as kids—from *capriolo*, a kid: *capro*, a buck: F. *capriole*, a caper in dancing]: to leap, skip, or jump; to prance; to spring: N. a leap: a skip, as in dancing; a leap in sport, as a goat or lamb. CA'PERING, imp.: ADJ. leaping; skipping. CA'PERED, pp. *-pėrd.* CA'PERER, n.

-pėr-ėr, one who. To CUT CAPERS, to dance in a frolicsome manner; to play pranks.

CAPE RACE: s.e. extremity of Newfoundland, in the section called Ferryland; lat. 46° 40′ n., long. 53° w. It is the first point of American land seen in crossing from England, and dangerous in foggy weather. It has a revolving light, established by the British government, and supported by a tax on all vessels passing between Great Britain and Canada or the Unitd States.

CAPERCAILZIE, n. *kā′per-kāl′zĭ* [Gael. *capal-coille*, the horse of the wood—from *capall*, a mare; *coille;* a wood]; called also, CAPERCAILLIE, or WOOD-GROUSE, or COCK OF THE WOODS (*Tetrao Urogallus*): largest of the gallinaceous birds of Europe. It is a species of grouse (q.v.), equal in size to a turkey; the male is the largest; the chest is of a shining dark green; there is a small scarlet patch of naked skin above the eye, and the

Capercailzie.

bill is whitish. The general color of the female and of young males is dark brown, freckled with yellowish brown; the front of the neck and the chest are yellowish chestnut; and the feathers of the under parts are generally edged with white. The Capercailzie has the feet feathered to the toes, but the toes are naked. It is an inhabitant of pine-woods; feeds on berries, seeds, worms, insects, etc., and on the young shoots of the pine, greatly preferring the Scotch fir to the spruce; occasionally also eating, at least in winter, the buds of the birch and other trees. The female makes her nest on the ground and lays from six to twelve eggs, of a pale reddish or yellowish brown, spotted with other shades of brown, and more than two inches long. Like the black-cock, the Capercailzie is polygamous.—The geographical distribution of the Capercailzie is very extensive: it is found on the pine-covered mountains of all parts of Europe, from Spain and Italy almost to the North Cape, and is abundant in northern

Asia. It was at one time found both in Scotland and Ireland, but was completely extirpated about the end of the 18th or beginning of the 19th c. Through the exertions, however, of the Earl of Fife and other proprietors of great highland estates, but particularly of the Marquis of Breadalbane, it has again been restored to the forests of the highlands of Scotland. The Capercailzie is very capable of domestication, and breeds readily, if allowed the range of a space containing a few pines tree. It is much esteemed for the table.

CAPE RIVER: properly *Vaunks*, taking its popular name from the proximity of its mouth to Cape Gracias a Dios, on the e. reach of the Mosquito shore in Central America. After a generally n.e. course of nearly 300 m., it enters the Caribbean Sea, about lat. 14° 59′ n., and long. 83° 11′ w. being navigable for a considerable distance upward.

CAPERNAUM, *ka-pėr′na-ŭm:* meaning 'the field of repentance,' or 'city of comfort': a favorite and exalted city in the time of Christ, and one of the three which he upbraided 'because they repented not.' It was on the n.w. coast of the Sea of Galilee, and its supposed site is now a heap of ruins, extending more than a mile along the shore and back toward the mountains, so overgrown with grass and bushes that it is difficult to move among them. The few notices of its situation in the New Test. do not enable us to assign its exact position. Thus the doom which the Lord Jesus pronounced against it has had fulfilment: so completely has it been 'cast down' that not even ecclesiatical tradition—so forward with its conjectures—has ventured to fix its site. There is warm dispute between the two most probable spots: *Khan Minyeh*, and *Tell Hûm*, 3 m. north, not far from where the river Jordan enters the Lake of Galilee.

CAPERS, n. plu. *kā′pėrz* [F. *câpre*—from L. *cappăris*, the caper-plant; Ar. *algabr*, the caper]: pickled flower-buds of the caper or caper-bush (*Capparis spinosa*). They have an agreeable pungency of taste, with a slight bitterness, and have long been in general use as a condiment and ingredient of sauces. They possess medicinal properties, being antiscorbutic, stimulant, and laxative. They are of a grayish green color, to improve which, however, copper is sometimes used, as in the case of gherkins and other pickles, rendering them poisonous. This can be detected by thrusting a polished iron rod into the vessel which contains the Capers; the surface of the rod soon becoming coated with copper, if it is present.—The caper-bush is a native of the s. of Europe, and other countries near the Mediterranean. It is extensively cultivated in some parts of the s. of France and in Italy, but most of all in Sicily. It thrives in the open air even at Paris, but in Britain requires artificial heat. It is a trailing, rambling shrub, loving dry places, and often grows on rocks or walls, adding a fresh charm of beauty to many an ancient ruin. It begins to flower early in summer, and con-

tinues flowering till winter. The buds are gathered every morning, and are immediately put into vinegar and salt: at the end of the season they are sorted according to their size and color, the greenest and least expanded being the best, and are again put into vinegar, the finest being sent to the market in bottles, the coarser in small barrels. The fruit, which is a small berry, is also pickled in the s. of Italy. The flower-buds of the caper of Mount Sinai (*Capparis Sinaica*) are pickled like those of the common species; the seeds are also pickled, and are called by a name signifying mountain pepper. The fruit of *Capparis aphylla* is made into a pickle in India. Species of *Capparis* are numerous in India, the warm parts of America, etc. See CAPPARIDEÆ. Various substitutes for C. are sometimes used, as the flower-buds of the marsh marigold (*Caltha palustris*), of the Indian cress (*Tropæolum majus*), and of the bean caper (*Zygophyllum Fabago*).

CAPERS, *kā'pẽrz*, WILLIAM, D.D.: 1790, Jan. 26—1855, Jan. 29; b. St. Thomas' parish, S.C.: Bp. of the M. E. Church, South. He graduated at South Carolina College 1808, and at once entered the S. C. Conference; was missionary to the Indians of w. Ga., presiding elder at Charleston 1825–31, and editor of the *Wesleyan Journal;* was sent to England 1828 as delegate to the Wesleyan Conference; became prof. of evidences of Christianity in Univ. of South Carolina 1835; edited the *Southern Christian Advocate* 1836–40; was a missionary sec. of the M. E. Church, 1840–44, and supt. of colored missions in the south 1844. He took part in the general conference of 1844, which resulted in the division between the n. and s. M. E. Church, and was elected bp of the M. E. Church, South, 1846. C. wrote *Catechisms for the Negro Missions, Short Sermons and True Tales for Children,* and an autobiography, included in Wightman's *Life* of him. He died at Anderson, South Carolina.

CAPER-TEA, n.: a kind of black tea-shrub, of which the caper-congou and scented caper are two varieties.

CAPE SABLE: s. extremity of the mainland of Fla.; lat. 25° 6′ n., long. 81° 9′ w.; the location of Fort Poinsett. The ground is low and sandy; on the n. is the Mangrove swamp.

CAPE SABLE: s. extremity of Nova Scotia, a rocky point on C. S. Island, in Shelburne co. lat. 43° 26′ n., long. 65° 38′ w. It has a lighthouse. The island is connected with the mainland by a ferry. Its 2000 inhabitants are mostly fishermen, descended from loyalists who left the United States during the revolutionary war.

CAPE ST. VINCENT, *vĭn'sĕnt:* headland, the s.w. extremity of Portugal; lat. 37° 2′ n., long. 9 w., noted for two naval battles in which British ships were engaged near it, 1693 and 1797. In the former, Admiral Rooke, who with some 20 English and Dutch men-of-war was convoying a fleet of some 400 merchantmen, was attacked off this point by the French Admiral De Tourville, and after a running fight lost several ships and 80 merchantmen. In 1797, Feb., Sir John Jervis, with a fleet of 15 sail, gave

battle to a Spanish fleet of 27 sail of the line, and defeated them, capturing four ships and driving the rest into Cadiz Bay, where they were blockaded.

CAPE SAN LUCAS, *sân lō'kŭs:* s. extremity of Lower Cal., dividing the Gulf of California from the Pacific; lat. 22° 44′ n., long 109° 54′ w. It forms the lower side of a bay on which stands the town of St. Joseph, 20 m. east.

CAPE SAN ROQUE, *sân rōk* or *rō'kā:* promontory on n.e. coast of Brazil, province of Rio Grande do Norte, 50 m. n. of Natal; lat. 5° 28′ s., long. 35° 16′ w. Owing to the sudden turn of the coast here from a direction nearly n. and s. to one almost e. and w., it is the most prominent object (on the map) on the shore line between Terra del Fuego and Yucatan.

CAPE SPARTIVENTO, *spâr-tē-vĕn'tō:* promontory of Calabria, in s. Italy, nearly at 'the toe of the boot;' lat. 37° 57′ n., long. 16° 5′ e. It was the ancient *Promontorium Herculis.* Strabo called it the southernmost point of the Italian mainland, but that point is really between C. S. and Cape Leucopetra or Capo dell' Armi.

CAPETIAN DYNASTY, *ka pē'shĭ-an dī'nas-tĭ:* third Frankish dynasty, founded about the close of the 10th c., when Hugo Capet ascended the throne. The surname CAPET has been derived from *cappetus,* 'a monk's hood,' because, though duke of France, Hugo was also abbot of St. Martin de Tours. On the death of the last Carlovingian monarch (Louis V., surnamed *Le Fainéant*—i.e., the Slothful), Hugo, the most powerful of French vassals, seized the throne, and by moderation and prudent concessions made to the authorities of the church, as well as to his brother-nobles, who had made themselves independent, contrived to retain the power he had seized. He was crowned at Noyon 987, July 3. In order to establish his dynasty, Hugo caused his eldest son Robert to be crowned as co regent, 988. Capet first made Paris the capital of France. He died 996.

Hugo's son ROBERT, a well-disposed but feeble ruler, ascended the throne at his father's death; he died 1031, beloved by his domestics, but despised by his neighbors and vassals, forgotten by his people, and having permitted all power to vanish from his hands. It was during his long lethargic reign that the towns and cities of France began to form themselves into corporations, to act in their own name, to contract obligations, and lay the foundations of middle-class freedom. In many other ways, also, the happy dissolution of royal power laid the basis of national prosperity.

Robert's sons were HENRY, who succeeded him, and Robert, ancestor of the older house of Burgundy.

Henry left two sons—PHILIPPE I., who ascended the throne, and Hugo, who distinguished himself in the first crusade (1096), and died 1102. Philippe, under the regency of Baldwin, Count of Flanders, came to the throne when only eight years old, and first really began to reign after the death of the regent (1066). He took hardly any part in the great movements, and events of his times, but supported

Robert, son of William the Conqueror, in his rebellion against his father. Consequently, William commenced an expedition against Paris, and would probably have dethroned Philippe, but died in 1089. By his dissolute course of life, Philippe fell under a sentence of excommunication issued by Pope Gregory VII., 1094, and, after doing penance, died 1108.

His successor, Louis VI., surnamed *Le Gros*, had, during Philippe's lifetime, been active in the support of the crown, and now extended the royal power which had been almost entirely confined within the duchy of Paris. By bold and vigorous measures he brought everywhere his vassals into real subjection to his authority, liberated the towns from baronial oppression, partly abolished feudal bondage, and extended considerably the jurisdiction of the crown. His life was an almost incessant contest with the small and turbulent vassals who had rioted in the license afforded them by the weakness of his predecessors. He died 1137, leaving a numerous family.

As his eldest son and coregent, Philippe, had died during the reign of Louis, his second son, Louis VII., *le Jeune*, now came to the throne, and by the marriage with Eleanor of Guienne, heiress of the Duke of Aquitaine, gained considerable accession to the power of the crown. He engaged in the second Crusade, and led 100,000 men to the east; but was unsuccessful, and returned to France after an absence of two years. In 1152 he divorced his unfaithful wife Eleanor, who subsequently married Henry Plantagenet, afterward Henry II. of England. This marriage made Henry far more powerful than the king of France, and Louis would probably have lost his crown had not the disturbances in England—the quarrels with Becket and with his own sons—proved sufficient to occupy Henry's attention. Louis le Jeune died 1180.

Philippe Auguste (q.v.), his son by a third marriage, ascended the throne ten months before his father's death, and proved himself the most able ruler of the Capetian dynasty. Against the wishes of his family, he married Isabella of Hainault, great-granddaughter of the last of the Carlovingians, and thus finally united the two houses.

His successor, Louis VIII., who died 1226, was said to have been poisoned by the Count of Champagne, paramour of the queen, Blanca of Castile.

Louis VIII. was followed by his son Louis IX. (Saint Louis, q.v.), who died at Tunis, 1270. Of the eleven children of St. Louis, the eldest, Louis, died aged 16 years, while the youngest, Robert, became the founder of the Bourbon dynasty (see Bourbon).

The second son, Philippe III., *le Hardi*, succeeded his father, and by the decease of two brothers and two uncles, acquired possession of Poitou, Auvergne, and Toulouse. His son (Philippe IV., *le Bel*) acquired by marriage Champagne with Navarre. These acquisitions, and his attempt to secure for his uncle, Charles of Anjou, the throne of Naples, involved Philippe III. in contentions with Italy

and Spain. He subjugated Navarre, 1276, and died of the plague 1285.

PHILIPPE IV., *le Bel*, succeeded to the throne when 17 years old. He soon gave signs of a despotic character, plundered the estates of the church, defied papal authority, persecuted the order of Templars (q.v.), and removed the residence of the pope to Avignon. The atrocious act of burning the grand-master, with 60 knights, of the order of Templars, after they had recalled all the confessions drawn from them by torture, has left an ineffaceable blot on the name of Philippe le Bel. He died 1314, and left three sons and a daughter.

The eldest son, LOUIS X., *le Hutin*, who ascended the throne, displayed remarkable weakness of character, and died 1316.

He was succeeded by PHILIPPE V., *le Long*, second son of Philippe le Bel, who died without issue.

By his death (1322) the crown came to CHARLES IV., *le Bel*, third son of Philippe le Bel, and the last of the direct line of the Capetian kings. He died 1328, leaving by his third marriage a daughter, named Blanche, who married Philippe, Duke of Orleans, and died (1392) leaving no issue. Isabelle (daughter of Philippe le Bel) married Edward II. of England, and was mother of Edward III., who consequently took the title of king of France, which was retained by the kings of England until the reign of George III.; but Philippe of Valois, cousin of the last Capetian king, and grandson of Philippe III., *le Hardi*, claimed the crown of France by virtue of the Salic Law, and so founded the dynasty of Valois (q v.).

CAPE TITMOUSE, *tit'mows* (*Parus Capensis*): small bird of the order *Incessores* and family *Paridæ;* its home is the Cape of Good Hope, Africa. It builds its nest in the shape of a narrow-necked jar or bottle, with a pouch outside, in which the male rests and keeps watch while his mate is hatching within. When she emerges and he follows, he closes the mouth or door of the nest by beating it violently with his wing. These displays of intelligence have attracted to the bird much attention.

CAPE TOWN: capital of Cape Colony, faces Table Bay to the n.e., is flanked by the mountain Lion's Head, with its continuation of Lion's Rump or Signal Hill, and has behind it the precipices of Table Mountain; lat. is 33° 56′ s., long. 18° 28′ 7″ e. Its mean temperature is 58·3° F. for winter, 76·6° for summer, and 67·3° for the year. It is connected by railway with a widening area; by telegraph with the diamond fields and the Orange Free State, as also by Natal and Aden with Europe; and by a weekly mail service with England. It is the chief port for the coasting trade and for foreign exports and imports; is well supplied with fish, meat, dairy produce, and every sort of fruit and vegetables, at a moderate price. It has a supply of fresh water of excellent quality. C. T. is the seat of the government, the supreme court, and a college and university. All the churches are well represented—the English Epis.

the Rom. Cath. and the Presb., Luth., Wesleyan, Congl., a free Church (chiefly an off-break from the Dutch Church), a Jewish synagogue, and a Mohammedan mosque for the Malay population. There are banks and insurance offices. The town is built upon a double slope, which subsides into a plain on the n.e. side. Its streets, at right angles to each other, are lined with houses, for the most part of an eastern type, with heavy walls, flat roofs, and large public apartments, interspersed with increasing numbers of shops and warehouses of the English style.

The most remarkable structures are the breakwater, with the docks and patent slip; the castle, with its outworks and bastions; the barracks for the military; the Rom. Cath. cathedral, with a few other places of worship; the museum and library, with the botanic gardens in front; and between it and Government House, a park, with its avenues shaded by stately oaks. Out of town, a little distance to the n.w. is Somerset hospital, and the royal observatory about two and a half m. to the northeast.

Cape Town returns four members to the colonial assemblies. The municipality is administered by a town-council of 18 members—three from each of six separate districts—and is presided over by a mayor elected annually by the council. The port of Cape Town possesses about 50 vessels with a united tonnage of about 5,000 tons. During the Boer War of 1899-1901 it was an important base of military supplies for the British, and also a port for the landing of troops. Pop. 83,898.

CAPE VERD, *vėrd:* most westerly headland in Africa, jutting into the Atlantic ocean, between the rivers Gambia and Senegal, lat. 14° 43′ n., long. 17° 34′ w. It was discovered by the Portuguese about 1445, and is said to have derived its name from a group of gigantic baobab-trees which adorns its summit.

CAPE VERD ISLANDS (*Ilhas Verdes*): group of islands belonging to Portugal, lat. 14° 45′—17° 19′ n., long. 22° 45′—25° 25′ w.; about 320 m. w. of the cape from which they take their name. The principal islands are ten—viz., Santiago (largest and most important), Fogo, Brava, Maio, Boavista, San Nicolâo, San Antonio, San Vicente, San Luzia, and Sal. There are besides four islets, barren and uninhabited; total area about 1,700 sq. m. The islands are all very mountainous, and owe their origin to the action of submarine volcanoes. The highest elevation is a volcanic peak, 9,157 ft. above the sea, on the island of Fogo, and which is still active. The climate is unhealthful during the rainy season. Though water is deficient, vegetation is luxuriant, yielding African and s. European products. Sugar, cotton, coffee, tobacco, and indigo are grown, and the trade in archil, monopolized by government, has in some seasons yielded as much as $120,000. Several of the European domestic animals thrive well. Turtles are abundant in the surrounding seas, and whales also are fished by British and American vessels. Amber is found on the coasts, and much salt formed by solar

evaporation is obtained from the lagunes on the shores, especially on the island of Sal. The inhabitants, mostly negroes, indolent but harmless, speak a corrupted form of Portuguese, called Lingua Creoula. The revenue for 1882–3 was estimated at about $260,000, and the expenditure for the same year at $225,000. The islands are under a gov.gen., exercising both civil and military authority. Pop. (1900) 147,424.

CAPE WRATH: the n.w. extremity of Scotland and of Sutherland, running out into the Atlantic; lat. 58° 38′ n., long. 4° 58′ 5″ w. From it a reef of rocks, perforated with arches and caverns, juts out into the sea. Off the cape is stag rock, a pillar 200 ft. high. C. W. is 600 ft. high, and there is a lighthouse near it, 400 ft. above the sea, visible 25 m. off.

CAPIAS, *kāp′ē-ăs* ('that you take'), a writ or process whereby the sheriff is ordered to arrest the body of the defendant. The writ, so framed as to call for the arrest of the defendant before judgment, in order to compel him to answer to a suit, is called a *capias ad respondendum;* if after the judgment, to compel him to satisfy the judgment, it is called a *capias ad satisfaciendum,* commonly abbreviated *ca. sa,*. In case of injuries without force, the civil law, and originally the common law, did not authorize the arrest of the defendant before judgment, that is, the arrest to answer; and upon feudal principles, says Sir William Blackstone (3 Com. 281), 'the person of a feudatory was not liable to be attached for injuries merely civil, lest thereby the lord should be deprived of his services.' The first writ of *capias ad respondendum* was given by act of Parliament in 1267, 52 Hen. III, c. 23, § I, which provided that 'if bailiffs, which ought to make account to their lords, do withdraw themselves, and have no lands nor tenements whereby they may be distrained, they shall be attached by their bodies, so that the sheriff shall cause them to come to make their account.' This act applied to a particular description of receivers, and supposed them not only to be debtors, but also to have in their own hands the evidence of the amount of the debt, the production of which was one object of the process. The statute of 13 Edw. I., c. II, passed in 1285, 18 years after the former, extends this process to 'all manner of receivers bound to yield account,' and provides 'if they be found in arrearages upon this account, their bodies shall be arrested, and, by the testimony of the auditors shall be sent into the next jail, and be imprisoned in irons under safe custody, and remain in prison at their own cost until they have satisfied their master (the creditor) fully of their arrearages.' It would appear that the practice of arresting on mesne process, that is before judgment, to answer in civil suits, grew out of these statutes; for the subsequent statutes of 25 Edw. III., c. 17 (1350), providing that 'such process shall be made in writ of debt, detinue of chattels, and taking of beasts, by writ of *capias,* as is used in writ of account'; and of

21 Hen. VII., c. 9 (1503); evidently have reference to an arrest to answer. Formerly, a writ upon which a suit was commenced was either a *capias*, distress, or summons; either the person of the defendant was seized, and (unless he was bailed) imprisoned until the trial, or his goods or lands were seized as a guarantee of his appearance to answer; and more often, in modern times, to obtain a lien to secure satisfaction of the judgment; or he was only summoned, that is, merely had notice that a suit had been commenced before such a court, by such a plaintiff, and was to be heard at such a time. The commencement of an action by summons is now the usual course of procedure; recent legislation, and especially the practical abolition of imprisonment for debt, having greatly restricted the use of writs of *capias* of any kind By the Debtors' Act. 1869 (32 & 33 Vict. c. 62), the writ of *capias ad satisfaciendum* is abolished, except in cases in which the defendant can pay, but will not. The same act provides that when a plaintiff has good cause of action against a defendant to the amount of £50 or upward, and the defendant is about to quit England, and the absence of the defendant from England will materially prejudice the plaintiff in the prosecution of his action, a judge may order the defendant to be arrested unless or until security be found.

Capillaries.

a, the artery; *b*, the vein; *c*, the intervening capillaries.

CAP'ILLARIES: extremely fine sub-divisions of the blood-vessels. The tubes which convey the blood from the left side of the heart to the various parts of the body are termed arteries, while those which return it to the right side of the heart, after it has discharged its various functions in the body, are known as veins; and the capillaries are the minute blood-vessels which form the connection between the terminal branches of the arteries and the commencements of the veins. These little vessels are of various sizes, some admitting only one blood-corpuscle at a time, while others are large enough to allow the simultaneous passage of two, three, or more corpuscles. They are smallest in the brain, and largest in bone. Their arrangement varies in different parts. In the accompanying figure, which represents their distribution in muscular tissue, they run for the most part parallel to one another; in other cases

(as around fat-cells) they have a spherical arrangement, in the skin and in part of the intestines they form loops; and there are many other forms of distribution. These various arrangements have been discovered by the microscopic examination of tissues that have been injected with colored fluids. The circulation of the blood through the Capillaries may be readily seen in the web between the toes of the hind foot of the frog, in the tongue of that animal, in the tail or gills of the tadpole, in the wing of the bat, etc.

CAPILLARY, a. *kăp′ĭl-lėr-ĭ* [F. *capillaire*, capillary—from L. *capillāris*, pertaining to hair—from *capil′lus*, hair—from *caput*, the head]: resembling hair; tubes or canals, extremely fine and minute, through which fluids ascend spontaneously, are called *capillary tubes*. CAPILLARY ATTRACTION, the force which causes fluids to ascend in fine tubes, or generally into porous substances (see CAPILLARY ACTION). CAP′ILLARIES, n. plu. *-lėr-ĭz*, in *anat.*, the extremely fine subdivisions of the arteries, etc. CAP′ILLAR′ITY, n. *-lăr′ĭ-tĭ*, the state or condition of. CAP′ILLA′CEOUS, a. *-lā′shŭs*, very slender, like hair. CAPILLAMENT, n. *kă-pĭl′lă-mĕnt*, a fine fibre or filament. CAPIL′LIFORM, a. *-lĭ-fawrm* [L. *forma*, shape]: hair-shaped. CAP′IL-LOSE, a., hairy.

CAP′ILLARY AC′TION: the effect of small tubes in attracting fluids into, or repelling them from, their orifices. When a clean glass tube with a fine bore, open at both ends, is plunged into a liquid capable of wetting it, such as water, the liquid is found, (1) to rise in the tube above the level of its surface in the vessel containing it; (2) to rise the higher in the tube above that level, the finer its bore is; (3) to stand above the general level in the tube where it approaches the sides (as in fig. 1, which is drawn on a greatly exaggerated scale), so that its upper surface in the tube is curved and concave. When a similar tube is plunged into a liquid incapable of wetting it, such as

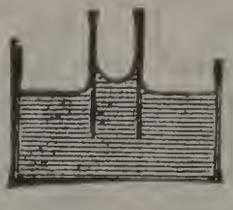


Fig. 1.

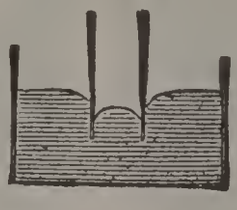


Fig. 2.

mercury, phenomena precisely opposite are presented. The liquid stands in the tube below the level of its surface in the vessel; and where it approaches the sides of the tube it stands below its general level in the tube, so that its upper surface is curved and convex, as in fig. 2, the convexity and depression in the tube increasing with the fineness of its bore. While such is the case with the two classes of liquids described, there are other classes on which fine tubes have no action, so that they stand in

such tubes at the same level as in the vessel, and with plane upper surfaces. These are the leading phenomena of C. A., the tubes with fine hair-like bores being called capillary tubes. The phenomena, however, are not dependent on tubes but may be produced by any contrivance which gives opportunity for similar action. For example, if we place two equal rectangular glass plates vertically in a liquid in such a way that they are in contact along a pair of vertical edges, as shown at A fig. 3, and the vertical edges at D are separated by a very small distance, the liquid (which may be colored to show the phenomenon more beautifully) will rise, if it wets the glass, into the thin wedge-shaped space between the plates. Suppose now that a capillary tube be plunged into the surface of a liquid so as to separate a portion of the liquid by its walls from the rest. Then if we consider the portion within the tube, all the forces of cohesion (q.v.) between particles of the liquid consist of equal mutual actions and reactions in equilibrium with each other except at the surfaces where the liquid is in contact with the air or with the walls of the tube. The force of adhesion of the several particles of the liquid are also in equilibrium except at the excerpt close to the upper surface of the liquid where a particle of the liquid has other neighboring particles of solid, liquid or air unsymmetrically placed with respect to it, while in the body of the liquid that is not the case. We therefore find the seat of capillary action to be confined entirely to the upper surface of the liquid and the adjoining surface of the walls of the tube. That this result is correct is evident from the fact that any variation in the size or shape of the tube at the upper surface will alter the elevation and shape of this upper surface, but no alterations in the shape or size of the tube at any point below this will produce any effect whatever upon capillary phenomena. The mutual cohesion of the particles of the free surface of the liquid cause it to act like a stretched elastic membrane, whose edges are pulled up or down by adhesion to the walls of the tube.

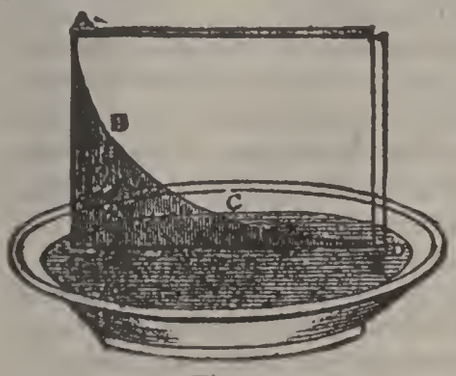


Fig. 3.

The height attained at any point being inveresly as the distance between the plates at that point, so that its upper surface will be a curve of the kind known as the hyperbola—being highest near the common edge, A, and lowest near the edges separated at D. If the same apparatus be placed in a trough containing mercury, the mercury will be depressed between the plates till its upper surface forms a hyperbola convex to the zenith. To understand the peculiar action producing these phenomena, it must be noted that the surface of a liquid at rest under

gravity is a horizontal plane (see HYDROSTATICS), and that this plane is maintained by gravity and the mutual attractions of the particles of the liquid.

Regarding the forms of the upper surfaces of columns of liquid in capillary tubes, it can be demonstrated mathematically that the same relations of the forces of attraction and cohesion which determine the elevation or depression of the liquid column determine also the form of its upper surface in the two cases of elevation and depression. In fact, the case of the elevated column resembles that of a cylinder of any very elastic substance (so elastic as to suffer change of form very readily under pressure), supported wholly by the *rim* at one of its ends; or, what is the same thing, by vertical forces acting in the lines composing its outer surface. Gravity draws down the concentric shells, of which the cylinder may be conceived to be composed, the further the more remote they are from the outermost, or that which is directly supported, the central rod being the most depressed. It appears that the form of the surface has an important bearing on the cause of the production of the whole phenomena.

The third fact of observation—viz., that the liquid rises higher or is more depressed the finer the bore of the tube—is thus explained in the case of elevation: Since the action of adhesion is confined to the superficial layer of the fluid, and between the same substances is, *cæteris paribus*, constant in quantity for an equal extent of surface, the wider the tube the shorter must be the column sustained, as the contents of the column raised by cohesion increase more rapidly when the bore increases than the attracting surface. The column increases with the square of the diameter of the tube, while the attracting surface increases only with the diameter. The height, therefore, is inversely as the breadth of the tube. That the depression must increase as the bore of the tube diminishes, appears from reasoning similar to that employed in the case just discussed.

The degree of elevation varies with the nature of the fluid, the variation depending partly on the difference of cohesion between the particles of the fluid, and partly on the difference of adhesion between the fluid and glass. It is found that temperature affects these forces, so that the height diminishes as the temperature rises.

The depression of mercury in a fine glass tube makes it necessary to use a correction in reading off the height of the mercurial column in the barometer, which owing to it, stands always a little lower than the height due to the atmospheric pressure. Experience, however, has shown that the capillary depression is nearly one half less in tubes which have had the mercury boiled within them than in unboiled tubes, as by the boiling a film of air, which in unboiled tubes adheres to the glass, is expelled. By widening the bore of the tube also, the error may be diminished so as to be neglected altogether. In a tube of $\frac{1}{4}$ inch in

diameter, in which the mercury has been boiled, the depression is 0.02 inch, while with a similar tube of ½ inch diameter it is only 0.003. The depression of mercury, it is found, is slightly increased by an elevation of temperature. It may be mentioned that in reading off the level of mercury in any instrument, such as the barometer, the height should be taken from the convexity of the curve. If the liquid used in the instrument, however, wets the tube, the height should be taken from the concavity.

As already stated, the phenomena are not dependent on the intervention of tubes; any capillary cavity suffices to produce them. When two light bodies, such as two bits of cork, are left to float on water, near each other, they soon come together, moving at last with a rush. This is sometimes given as an example of the gravitation that draws the planets to the sun; but it is really owing to this capillary action that we are considering. When the liquid wets the floating bodies, it rises slightly all round them, and this sustained liquid hangs as a weight on them on all sides. So long as it rises equally, there is no motion; but when the bodies come near each other, the space between them becomes like part of the inside of a capillary tube, the water rises higher there than on the other sides, and the bodies move toward the sides that are most strongly pulled. When the floating bodies are not wetted by the liquid the surface between the two bodies is depressed, as that of mercury is inside a glass tube, and the bodies descend, as it were, down the opposing slopes, and meet in the bottom of the hollow. If one of two bodies floating on water is smeared with oil, so as to prevent the water from adhering, instead of coming together the two will recede from each other, for reasons analogous to the above.

C. A. acts a most important part in nature in a great variety of ways. An instance of its employment by man is seen in the wicks of lamps and candles, which, being composed of fibrous materials, furnish many hair-like channels by which the melted oil is elevated to the flame, and supplied as fast as it is consumed. C. A. influences the circulation of fluids in the porous tissue of animals, and it is the principle mode in which water, with the various substances which it holds in solution is supplied to the roots of growing plants. It is through it that in summer droughts moisture is raised to the surface for the maintenance of vegetable life. C. A., too, affects many phenomena usually considered under the head DIFFUSION (q.v.) of fluids and gases. For its relation to the phenomena known as exosmose and endosmose, see OSMOTIC ACTION.

A familiar illustration of C. A. is furnished when one end of a towel happens to be left in a basin of water while the other hangs over the side below the level of the water; the basin is soon emptied of its contents. It is important to observe that, although the towel will become wet, not a drop will flow from it, unless the outside end reach below

the level of the water in the basin. In this respect C. A. resembles the action of the siphon. And this shows the error of supposing that water may rise through the earth by C. A., and flow out as springs at a higher level than the source whence it is drawn.

Some very interesting experiments have been made by M. Poisenille (*Ann. de Chimie et de Phys.* III. xxi. 76) concerning the flow of liquids through the capillary tubes, from which it appears that when the tube exceeds a certain length—which is greater as the bore increases—the following laws regulate the rate of efflux of the liquid, the efflux taking place under pressure: 1. The flow increases directly as the pressure, so that under double the pressure, double the amount is discharged in equal times. 2. In tubes of equal diameter the quantities discharged vary inversely as the length of the tube. If a tube 2 inches long discharge 100 grains in 5 minutes, a tube 4 inches long will discharge only 50 grains. 3. In tubes of equal lengths, but different diameters, the flow is as the fourth power of the diameters. If one be $\frac{1}{50}$ of an inch in bore, and the other $\frac{1}{100}$, the efflux from the larger will be 16 times as great as from the smaller. It is further found that the efflux varies with the nature of the liquid, the material of the tube not appearing to affect the result in any great degree. No law of the rate of efflux has yet been discovered, depending on the density, capillarity, or fluidity of the fluids.

Tubes to be used in the experiments on capillarity should be perfectly clean and dry. If wetted, the film of moisture on the tube forms a new tube, and the action will be the same as with a tube of the substance forming the film. See Miller's *Elements of Chemistry*, and J. Clerk Maxwell's *Theory of Heat*, the phrases 'superficial energy' and 'superficial tension' being substituted for 'capillarity.'

CAP'ITA, DISTRIBUTION PER: i.e., distribution by heads, or by numbers, equally; occurring in the case of several claimants to the property of a deceased person, all severally claiming in their own right, in equal degree of kindred, and not under any right of representation: see INHERITANCE: SUCCESSION.

CAPITAL, a. *kăp'ĭ-tăl* [F. *capital*, capital, chief—from L. *capĭtālis*, that by which life is endangered, pre-eminent — from *caput*, the head: It. *capitale*]: chief; principal; first in importance; punishable by loss of life; great; large of size; N. the ornamental part of a column, pillar, or pilaster, placed at the top immediately over the shaft, but under the entablature (till the period of the Renaissance, the head of a column was, in Eng., called chapiter [chapter], its diminutive being chapitrelle: see COLUMN); a chief city or town of a country or province, the seat of the government; a large letter or type; a stock-in-trade, consisting of money or goods; the debt or sum lent as distinguished from the interest. CAP'ITALLY, ad. *-lĭ*, in the highest degree; with loss of life. CAP'ITALIST, n. *-ĭst*, one possessed

of large means engaged in, or able to engage in, extensive business undertakings. CAP'ITALIZE, v. *-īz*, to convert into capital, as money or stock. CAP'ITALI'ZING, imp. CAP'ITALIZED, pp. *-īzd*. CAP'ITALIZA'TION, n. *-ī-zā'shŭn*, act by which anything is converted into capital. POLITICAL CAPITAL, some national loss or disaster, some errors of opponents, or the like, by sagacious use of which a political party in the state may strengthen its position and chances of power. CAPITAL FELONIES, crimes for which a criminal may be hanged—formerly many, but now only a very few, and those of a desperate character (see FELON).—SYN. of 'capital, a.': principal; chief; leading; controlling; prominent.

CAPITAL, in architecture: the uppermost member of a column, that is to say, a separate piece of stone set upon the shaft and supporting an epistyle or the abutment of an arch—in short the mass of the building which is imposed upon the column.

A column must always have a shaft and a capital; without these features it would be a post, perhaps a pillar or a pier, but would have no architectural character. The capital, moreover, has generally received the most elaborate decorative treatment of the whole composition.

The capitals which have excited the most interest among European students of art are those of the three Greek orders and of the five Renaissance orders which were deduced from the first three. The capital of the Grecian Doric is a reversed cone rounded off at top and carrying a square plinth or die; this plain *echinus* was richly painted in bright colors. The capital of the Ionic order is a curious device consisting of scrolls or volutes, two on each of the two opposite sides, so that this capital, almost alone, has not the same appearance from every point of view. The capital of the Corinthian order is a circular bell, surrounded by acanthus leaves and having at each corner a couple of projecting scrolls not unlike those of the Ionic order but small. In mediæval architecture, both Romanesque and Gothic, the capitals are almost infinitely varied.

CAPITAL, in Fortification: imaginary line dividing a defense-work into two similar and equal parts. The capital of a bastion is a right line drawn from the point or salient angle to the middle of the gorge or entrance in the rear. The capital of a ravelin is a right line drawn from the re-entering angle of the counterscarp to the salient angle of the ravelin.

CAPITAL, in Trade and Political Economy; in its restricted sense, applied to the money or the property convertible into money, with which a trader or producer carries on his business. In this sense Adam Smith and many other writers call it stock; and there is a convenience in having a separate term for expressing this sense of the word capital, since it is totally different from its wider sense as an element in political economy. Many attempts have been made to define capital in its general sense, but

with imperfect success, since no sooner is a restrictive definition laid down, than some one can point at things which are capital, yet not included in the definition. It has, for instance, been called the produce of past labor stored up and applied to the facilitating of future labor; but, as we shall see, many things become capital which the hand of man has never touched. There is no doubt, however, that the existence of capital arises out of the fact of labor or industry having been exercised; and perhaps a good general understanding of its character may be derived from treating it as the *impulse* or *impetus* which past industry gives to facilitate future industry. Wherever something is reserved from immediate consumption, and made to serve in future production, there is capital. A good illustration is in the first bow and arrow made by the savage. He has expended on this machine for securing his food a portion of the time and labor which he might have given to the tedious task of catching his food with his own hands, and at this sacrifice he has obtained the means of more easily and economically obtaining it in future. All capital is not, however, *directly* made by the industry of the owner, or, indeed, by industry at all. The accidental finder of a diamond, or a pearl, worth £100, possesses so much capital. His acquisition, however, would have no value but for those productions of industry which it is permitted to represent, and if pearls and diamonds were often found they would cease to be valuable; the trade of finding them is as laborious and as ill remunerated in the long-run as most others. The owner of a barren heath, intrinsically worth nothing, finds it become suddenly valuable by the progress of a large town; but it is the industry, or at least the prosperity, of that town which has given the value, and the owner, having the good fortune to have a hold on a portion of the produce of that industry, becomes a capitalist. It is impossible to enumerate all the elements of which capital in the general sense consists, or all the ways in which it can be made. Whatever thing done or possessed enables some other thing to be done or procured which supplies any of the necessities or wishes of the human race becomes capital. Thus, the education and skill of the barrister the physician, and the artist—the agility, acquired through long and toilsome practice, of the rope-dancer and the juggler—all are capital. It makes capital to shift the place of a thing, bringing it from where it is not, to where it *is*, wanted. So, also, the changing of a person's place may become capital to him, as where he leaves a district in which his trade is not required, or exceeds the demand, for one where he can pursue it to advantage. Successful emigration thus creates capital, bringing into human use districts of land previously useless. The total capital at any time in existence consists of an aggregate of the several capitals at the command of individuals or communities. But it is essential to any unit of capital that it should be sufficient for the purpose it is intended for,

otherwise it may seem to be, but will not in reality be, a part of the general aggregate—it will, in fact, be lost. If an expenditure of $5,000 be necessary to raise a sunken ship, and only $4,500 are expended, that sum, which might have been available for some other purpose, is lost. Capital, as distinguished from property or wealth, is a *moving force;* and if it be not sufficiently strong for accomplishing its purpose, it is lost. This is one of the most important truths in all political economy, since most of the great losses suffered by communities and individuals arise from undertakings for which they have not adequate capital, or for which that which seems to be capital does not really turn out to be so. Perhaps the most memorable mistake of this kind ever made was when the French revolutionary government issued assignats (q.v.) These were issued ostensibly on a good security—namely, the security of the forfeited land. But however valuable that land might be in the long-run, it was not available to pay the assignats; there was no purchaser for it; and the assignats consequently fell in value. Gold to a far less amount than the money value of the land—that is to say, than the price which would be paid for it when sold in the natural course of things—would have been a sufficient capital for the issue of these assignats. The same mistake is often made on a small scale when a landed proprietor keeps together a large estate which he cannot afford to improve and cultivate properly. It loses its power of capital in his hands; and he would be in much better condition if he sold a portion of it for money to be invested in improvements on the remainder. Probably 19 out of every 20 bankruptcies arise from the bankrupts having undertaken enterprises beyond the reach of their capital—from over-trading, or over-speculating, as it is otherwise called. When speculation becomes epidemic, the whole community suffers from undertakings too great for its capital and a crisis occurs. Such was the great railway crisis of 1847 in Great Britain. Parliament had, in the previous year, passed bills for the construction of railways, which, if they had all been made, would have cost upward of £130,000,000—a sum which the country, rich as it was, could not afford to advance. Though it is an axiom that people cannot trade beyond their capital, yet what can be accomplished by any given amount of capital must depend on the skill and sagacity of the person employing it. Competition no doubt tends to equalize profits, but competition is itself a contest in which each tries to drive a more profitable trade than his neighbors, and some are more successful than others. A frequent element of success is the rapid circulation of capital, by which it is made to return repeated profits, though perhaps small ones, in the course of the year. The trader who turns over his capital ten times at a profit of 3 per cent., makes more than he who draws a single profit of 10.

CAPITAL PUNISHMENT.

CAPITAL PUNISHMENT, in Criminal Jurisprudence: the punishment of death. It is called *capital* punishment because the head (L. *caput*), is usually that part of the body which is acted on, as especially in beheading and hanging. This extreme penalty, notwithstanding the practice of the world from the remotest times down to the present day, has frequently been reprobated by philosophers and philanthropists, who have even gone so far as to deny to any earthly power the right so to punish. The weight of authority, however, appears in favor of capital punishment. Bentham, one of the most reasonable and discriminating authorities on the subject, in his well-known and valuable treatise, says, that the idea of capital punishment would naturally suggest itself in the infancy of a state. When any one had committed an offense, and disturbed the peace of society, the question would then first arise: 'How shall e prevent these things?' and the answer most likely to occur to a set of barbarians would be: 'Extirpate the offender, and give yourself no further trouble about him.' And in conformity with this view of the matter, he alludes in a note to the case of the Hottentots, who have no fixed laws to direct them in the distribution of justice, and consequently, when an offense has been committed, there is no form of trial, or proportion of punishments to offenses; but the kraal (village) is called together, the delinquent is placed in the midst, and without further ceremony, demolished with their clubs, the chief striking the first blow. The Marquis Beccaria, in his remarkable *Essay on Crimes and Punishments*, strongly argues against the capital sentence being carried out in any case, denying the right, in fact, of government so to punish, and maintaining, besides, that it is a less efficacious method of deterring others, than the continued example of a living culprit condemned, by laboring as a slave, to repair the injury he has done to society. Bentham, on the contrary, holds that death is regarded by most men as the greatest of all evils; and that especially among those who are attached to life by the ties of reputation, affection, enjoyment, hope, or fear, it appears to be a more efficacious punishment than any other. On the question of right, Beccaria is still more pointedly refuted by Sir Samuel Romilly, who observed: 'Beccaria and his disciples confess that it is not the greatest of evils, and recommend other punishments as being more severe and effectual, forgetting, undoubtedly, that if human tribunals have a right to inflict a severer punishment than death, they must have a right to inflict death itself.' (*Memoirs*, vol. iii. p. 278).

Against capital punishment arguments are often urged from Scripture, based on the general principle of Christian charity, as set forth in the New Testament. To these it is replied that they proceed on a misapprehension and misapplication of the principle; and reference is confidently made to the Old Testament as sufficiently exhibiting the mind of the great Lawgiver in regard to this matter. The experiment of abolishing capital punishment has been

tried in Wisconsin and Maine since 1874, and in Iowa since about that time; but it seems not yet to have resulted in a settled opinion on the question. In Iowa the death penalty was re-established after about four years, owing to the alarming increase of violent crimes; it is required, however, that at least a year shall intervene between the sentence and its execution. In the other states capital punishment retains its legal place, and seems likely to do so. Capital punishment was abolished in Switzerland, Holland, Portugal and Roumania; but when, 1881, the power was conferred on the several Swiss cantons of deciding whether to restore the death-penalty or not, some of them availed themselves of the permission to restore it.

Death was, in former times in England, the ordinary punishment for all felonies, and the certain doom of those who could not avail themselves of *benefit of clergy* (q.v.), i.e., the common law inflicted death on every felon *who could not read*, and the law implied that punishment, where a statute made any new offense felony. On the other hand, the numerous acts of parliament creating felonies without benefit of clergy, show that the statute law was still more sanguinary, so that of the 160 offenses referred to by Blackstone as punishable with death four-fifths had been made so during the reigns of the first three Georges. That some idea may be formed of such Draconian justice as was then established, the following may be mentioned as among the offenses which involved sentence of death—stealing in a dwelling-house to the amount of 40*s.*; stealing privately in a shop goods of the value of 5*s.*; counterfeiting the stamps that were used for the sale of *perfumery*: and the stamps used for the certificates for *hair-powder*: Thanks, however, to the exertions of Sir Samuel Romilly, such inhumanity and impolicy of the criminal code gave way, toward the end of the reign of George III., to a course of legislation which has reduced the application of death, so that practically it is only in the case of treason and murder that the capital sentence is ever pronounced; and even then it is not always executed, for the crown reserves to itself and exercises a right of review which frequently leads to such a change in the convict's fate as at least spares his life. This discretionary control on the part of the executive is essential in the present state of the law, which affords no means for a judicial appeal on the merits; for the very nature of the punishment, when finally executed, precludes the idea of all benefit to the sufferer should the verdict of the jury afterward turn out erroneous, and the innocence, instead of the guilt, of the accused be established. The law as it stands, indeed, allows capital sentence to be reversed if technical error can be shown on the face of the judgment or other matter of record—but what avails that, after the sentence has been executed.

In Scotland, the administration of the criminal law has perhaps been, on the whole, as severe as in England. Mr. Erskine says, that 'those crimes that are in their consequences *most hurtful to society* are punished capitally or by death,' a category that is certainly sufficiently indefinite;

and anciently, it might be shown that the executions in Scotland for offenses corresponding to those capitally punished in England, were, in proportion to the population, quite as numerous as those in the latter country. But in the more modern practice of Scotland, capital sentence was pronounced only in the four pleas of the crown—viz., murder, rape, robbery, and wilful fire-raising, to which may be added housebreaking. At present the penal system in Scotland may be said to be identical with that in England.

Under the laws of the United States, the death penalty *may* be inflicted for the following crimes: treason, murder, arson (of a dwelling), rape, piracy, robbery of mails if endangering the lives of persons in charge, rescue of a convict on the way to suffer the death-penalty, burning a United States war-vessel, and corruptly destroying a private vessel. These crimes are such as involve, or tend to involve, the taking of human life. The actual execution of the death-sentence however is not frequent. The great war of secession, though many of its leaders had taken oath as officials to support and defend the constitution of the United States, was followed by no infliction of death for treason.

With respect to the mode of executing capital punishment, the cruelties and tortures of former times are well known. The methods now mostly practiced are *electrocution* (N. Y. and O.) *hanging and beheading.* In Spain, the death of the culprit is instantaneously caused by the *Garrote* (q.v.). In England, Scotland, and Ireland, and in all the dependencies of the crown, the convict is hanged; in France he is decapitated by the *Guillotine* (q.v.), an instrument which the old Scotch *Maiden* (q.v.) very much resembled. In Germany, beheading is the mode of execution adopted; but in Austria, hanging. For the mode in the United States, see EXECUTION OF THE DEATH PENALTY. See EXECUTION. For capital punishment in the U. S. Army, see the law passed by congress, containing the articles of war, 1806, Apr. 10; for capital punishment in the U. S. Navy, see the similar act passed 1864.

See Basil Montagu *On the Punishment of Death* (1813); *Memoirs of Sir Samuel Romilly* (1840), and his writings; Bentham, *Rationale of Punishment* (1830); Beccaria, *Essay on Crimes and Punishments* (1775); Berner, *Die Abschaffung des Todesstrafe* (1861); Mittermaier, *Die Todesstrafe* (1862); Eng. edition by J. M. Moir; Von Holtzendorff, *Das Verbrechen des Mordes und die Todesstrafe* (1874); Clode's *Administration of Justice under Military Law.*

CAPITALS (*majuscula*): in distinction from small letters (*minuscula*): the large letters employed in writing and printing to help the eye, to relieve the uniformity of the page, to increase the facility of keeping and finding the place, to mark the beginnings of sentences, proper names, etc.—Among the ancients, and during the earlier middle ages, no distinction of capitals and small letters

was known; and after the practice had been introduced of beginning books and chapters with great letters often adorned or illustrated with much artistic ability, it was long before capitals were employed in such a way as could afford much real advantage to the reader. At the present day, they are universally employed, even in the printing of Greek and Latin books. There has been, and still is, considerable diversity with regard to the occasions for their use, the books of the 17th and 18th c. exhibiting a much greater proportion of them than those of the present day, though in recent years there is in England and America a tendency to revert to a more frequent use of capitals. In German books, all substantives usually begin with a capital letter; in English and French books of the present day, they in general appear only at the beginnings of sentences and of proper names. Adjectives formed from proper names, as *English*, *French*, etc., are generally begun with a capital in English books, but not in French nor in German ones.

CAPITANATA, *kâ-pe-tâ-nâ′tâ*, or FOGGIA, *fŏd′jâ:* province of Italy, the *Daunia* of the ancients; bounded n. and e. by the Adriatic, and on the s.w. by the Apennines. It stretches along the Adriatic about 70 m. in a straight line, and its average breadth is about 45 m.; but its coast line, measuring round the great promontory of Monte Gargano, 'the spur of Italy,' is fully 100 m., and its breadth between the extremity of that projection and the Apennines, 75 m. The greater part of the surface is a sandy plain sloping from the Apennines to the Adriatic, watered only by inconsiderable streams. The rearing and feeding of cattle form the chief occupations of the inhabitants. Wheat, wine, and fruits of various kinds are produced in quantities sufficient to admit of exportation. There are important salt-works, quarries of alabaster, and potters' clay. Foggia is the chief town. Pop. 425,450.

CAPITAN-PACHA, n. *kăp′ĭ-tăn-pă-shâ′* [Sp. *capĭtan*, a captain—a word adopted by the Turks]: the chief admiral of the Turkish fleet. High admiral of Turkey, having entire command of the navy and management of all naval affairs. The port of Pera, the Turkish islands in the archipelago, and a number of seaports and maritime districts, are under him even in their civil administration.

CAPITATION, n. *kăp′ĭ-tā′shŭn* [F. *capitation*, a poll-tax—from mid. L. *capitātĭōnem*, a capitation-tax—from L. *capĭtātus*, having a head—from *căput*, the head]: a numbering of persons as if per head: so much per head or individual; a poll-tax. CAPITATE, a. *kăp′ĭ-tāt*, in *bot.*, like a pinhead; having a rounded summit, as some hairs, and stigmas. CAPITATION-GRANT, a sum of money paid by government to each person fulfilling certain specified conditions. CAPITATION-TAX, a tax imposed on each person above a certain age without reference to property and similar incidents. The term was formerly used in France for the tax better known as the *taille*, though that offensive impost was not applied to all alike.

CAPITOL, n. *kăp'ĭ-tŏl* [L. *capitolĭŭm*—from *căput*, the head]: the temple of Jupiter in Rome and a fortification where the senate of anc. Rome met; the hill on which that temple stood—the *Mons Capitolī'nus;* the building in Washington occupied by the congress of the United States (see WASHINGTON); the building in which the legislative body of any of the States assembles. CAPITOLIAN, a. *kăp'ĭ-tō'-lĭ-ăn*, or CAPITOLINE, a. *kăp'ĭ-tōl-īn*, pertaining to the capitol (q.v.) of Rome, or the hill on which it stood.

CAP'ITOL, of ancient Rome: the fortress and site of the national sanctuary of the temple of Jupiter; on the *Mons Capitolinus,* the smallest but most famous of the seven hills on which Rome was built. The hill itself was first termed *Mons Saturninus,* afterward *Mons Tarpeius* and *Rupes Tarpeia,* and after the foundation of the capitol, *Mons Capitolinus,* though a particular portion of it retained its ancient name of *Rupes Tarpeia.* It was steep and abrupt in almost every part, a natural fortress, strengthened here and there by towers. The capitol was founded by Tarquinius Priscus, and completed by Tarquinius Superbus, who tasked the people to work at it. The whole mount had a circumference of about 800 paces. During the civil wars under Sulla, the temple was burned (according to Tacitus, by design), and after its restoration, destroyed during the Vitellian riots. It was rebuilt by Vespasian, after whose death it was again destroyed by fire, but was once more restored by Domitian, who instituted here the Capitoline games. Domitian's structure lasted to a late period of the empire. Regarding the site of the Capitol there has been great dispute, the German scholars, for the most part, maintaining that it occupied the s.w. summit of the hill, and the Italians, the n.e. The latter situation has the weight of probabilities in its favor. From that portion of the mount named the Tarpeian Rock, state criminals were thrown down. According to the description given by Dionysius of Halicarnassus, the temple of Jupiter, with its peristyle of columns, was 200 ft. long by 185 ft. wide, and was divided into three cellæ, separated from each other by walls, and respectively dedicated to Jupiter, Juno, and Minerva. In the spacious portico, the people feasted on triumphal occasions. The scanty ruins remaining in the present day consist of a substructure of perperino or volcanic tufa, a wall of the same materials, and some remains of the s. front, together with a portion of the great flight of steps leading to the temple.

The modern capitol (*Campidoglio*), built on the site, and partly on the foundation of the ancient capitol, was designed by MichaelAngelo, but is one of his inferior works. The main entrance, however, presents a splendid view. It is used as a kind of hotel-de-ville and museum.

Besides the great temple of Jupiter, the most important structures on the Capitoline Mount were the temple of Jupiter Tonans, built by the Emperor Augustus; and the magnificent *Tabularium,* containing archives, and, in connection with the Ærariun ('Treasury'), serving as a

library and place for lectures, etc. The remains of this structure, built by Quintus Catulus, B.C. 73, have still an imposing aspect.

CAPITOLINE GAMES, *kăp'ĭ-tol-īn gāmz* (*Ludi Capitolini*): instituted in Rome B.C. 387, at the suggestion of Camillus, in honor of Jupiter Capitolinus, and to commemorate the preservation of the capitol from the Gauls. These games were celebrated annually, and one of their features was the selling at auction of the *Sardiani*, supposed to mean Sardinians or Veiians. The Capitoline Games fell into disuse, and were revived by Nero after the model of the Olympic Games, as a quinquennial celebration. Nero attempted to bring in a new computation of time by them, as had been done by the Olympiads among the Greeks.

CAPITULAR, n. *kă-pĭt'ū-lėr*, or CAPITULARY, n. *-lėr-ĭ*, [mid. L. *capit'ulārĭs*—from L. *căpĭtŭlum*, a little head, the head or chapter of a pillar—from *căput*, the head]: the laws of an ecclesiastical councilor chapter; the member of a chapter: ADJ. relating to the chapter of a cathedral. CAPIT'ULARLY, ad. *-lĭ*. CAPIT'ULARIES, n. plu. *-lėr-ĭz*, laws issued by the kings of the first and second of the Frankish races, from Charles Martel downward. These laws proceeded from the great assemblies of the king, nobles, and bishops, which formed the states of the kingdom, and, from their general character, were distinct from the laws issued for the separate states, which were called *leges*. They were divided into general and special capitularies, according to the more or less general nature of the interests which they embraced, and the mode of their publication. They have not all been preserved. The most famous are those of Charlemagne and of St. Louis. In 1287 Abbot Angesius, of Fontenelles, made a collection of the capitularies of Charlemagne, and of his son, Louis le Débonnaire.

CAPITULATE, v. *kă-pĭt'ū-lāt* [mid. L. *capitulātus*, chaptered, proposed terms—from *capit'ulum*, a little head—from L. *căput*, the head]: to surrender, as an army or garrison to an enemy, on certain conditions, or on an agreement under certain heads: ADJ. in *bot.*, furnished with a capitulum. CAPIT'ULA'TION, n. *-lā'shŭn*, the act of thus surrendering to an enemy; the written conditions or treaty; CAPIT'ULATING, imp. CAPIT'ULATED, pp. CAPIT'ULA'TOR, n. *-tėr*, one who. CAPIT'ULUM, n. *-lŭm*, in *bot.*, a flower-head composed of a number of florets arranged without stems on the summit of a single peduncle; in *nat. hist.*, the body of a barnacle as being supported upon a stalk or peduncle.

CAPITULATION, *ka-pĭt-ū-lā'shŭn:* treaty consisting of several specified conditions. In the military sense of the word, a capitulation is a treaty of surrender to an enemy. When a place can no longer be defended, on account of failure of ammunition or provisions, or the progress made by the besieging-party, a white flag is commonly put up, as a sign

that the besieged are willing to capitulate. According to the kind and degree of peril in which the fortress is placed, so are the terms which its governor may reasonably expect from his successful opponent. Sometimes the arms and military stores are left to the besieged, but more frequently they are taken by the besiegers, except articles of private property belonging to the officers and men. The 'honors of war,' the marching out with drums beating and colors flying, are usually stipulated for, unless the conqueror exacts very severe terms. The mildest form of a C. is a *convention,* agreed to when the conqueror is not strong enough to insist on stringent conditions.

CAPIVI, n. *kă-pē'vi:* see COPAIBA.

CAPIZ, *kâ-pēs':* town on the island of Panay, in the Philippine archipelago. It is on a plain on the n. coast, near the rivers, Panay, Panitan, and Ivisan, by which it is sometimes inundated during the rainy season. It is defended by a small fort, and is the residence of a Spanish alcalde. Pop. 11,000.

CAPLIN: see CAPELAN.

CAPNOMANCY, n. *kăp'nō-măn'sĭ* [Gr. *kapnos,* smoke; *manteï'a,* divination]: divination by the motion or the appearance of smoke. The ancients practiced it in two different ways—either they threw grains of jasmine or poppy on the burning coals, and watched the motions and the density of the smoke that rose from them, or they watched the smoke of sacrifices. This latter kind of C. was most generally employed, and that to which the greatest importance was attached. If the smoke was thin, and ascended in a right line, instead of being blown black by the breeze, or spreading over the altar, the augury was good. It was also believed that the inhalation of the smoke rising from the victims or from the fire which consumed them, gifted the priests with prophetic inspiration.

CAPNOMOR, n. *kăp'nō-mŏr* [Gr. *kapnos,* smoke; *moira,* a part]: a colorless oil obtained from the oil of tar.

CAPOC, n. *ka-pŏk':* a kind of cotton, so short and fine that it cannot be spun; used in India to make mattresses, etc.

CAPOCH, or CAPOUCH, n. *kă-pŏch'* [Sp. *capucho*—from *capa,* a cover]: a monk's hood; the hood of a cloak.

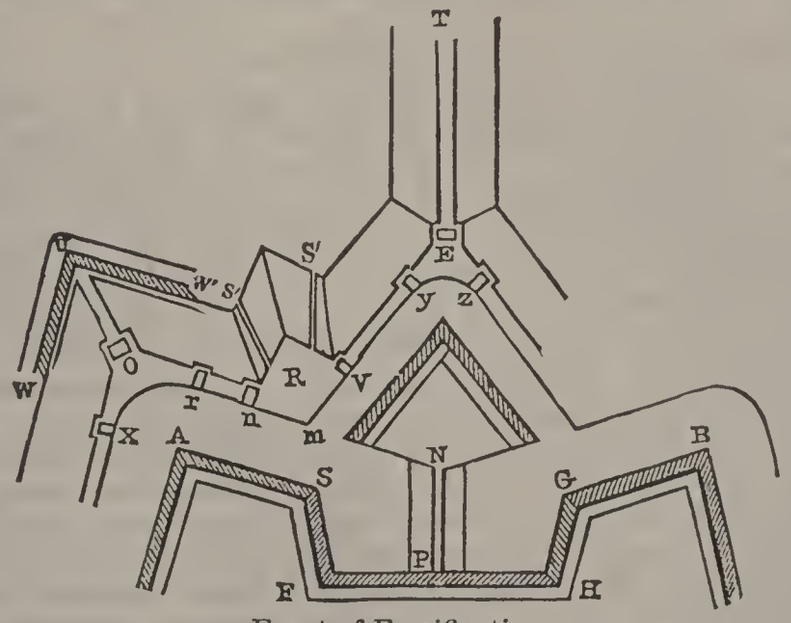
CAPO D'ISTRIA, *kâ'pō dĭs'trē-â:* fortified seaport town of Austria, on a rocky island in the Gulf of Trieste, 8 m. s.w. of the city of Trieste; cap. of the circle of Istria, with the peninsula of which it is connected by a stone causeway, nearly half a mile long. Its old buildings, ruinous walls, and narrow streets, give the town a gloomy aspect. It has a cathedral, manufactures of leather and soap, and a trade in wine, oil, and salt. In ancient times this place was known as *Ægida,* and afterward as *Justinopolis,* in honor of Justin II., who restored it. Pop. (1880) 8,646.

CAPO D'ISTRIA, or CAPO D'ISTRIAS, JOHN ANTHONY, Count: president of the Greek republic (1827–31): 1780–1831, Oct. 9; b. Corfu. His family had been settled

in that island since the 14th c., but orginally came from the Illyrian town of Capo d'Istria (q.v.) near Trieste. He devoted himself to political life, and after having held high position in the Ionian Islands he entered the diplomatic service of Russia. Here his diplomacy tended to the separation of Greece from Turkey. In 1827, he was elected pres. of Greece; and 1828, Jan., he landed in Greece, and entered upon his office. He was a patriot, a philanthropist, and an able diplomatist, but not equal to the task which he now undertook. Everything was in disorder; the people, long enslaved, knew not how to use their freedom; and the president had been so much imbued with the centralizing principles prevalent at the courts which he had frequented, that some of his measures, especially that restricting the liberty of the press, gave offense to the most temperate of the enlightened lovers of civil liberty. His career was cut short by his assassination in a church at Nauplia. The assassins were relatives of Peter Mauromichali, against whom he was urging on a prosecution, for alleged offenses against the state.

CAPON, n. *kā′pŏn* [F. *chapon*, a capon—from L. *cāpōnem*, a capon: AS. *capun;* Sp. *capar*, to castrate]: a cock-chicken fed for the table; a castrated cock. CA′PONIZE, v. *-pŏn-īz*, to castrate, as a fowl. CA′PONI′ZING, imp. CA′PONIZED, pp. *-īzd.*

CAPONIERE, n. *kăp′ō-nēr′*, or CAPONNIÈRE [F. *caponnière*. Sp. *caponera*, a coop]: in *fortification*, a parapet 8 or 10 ft. high, with a superior slope, terminating in a small glacis. It is placed in the ditch of a fortified place to cover or screen the defenders while passing from one



Front of Fortification.

defense-work to another. Generally it has a banquette, on which musketeers may stand to fire over the crest. If there is a passage between two such parapets, it is a *full* caponnière; if on one side only, a *half* caponnière. Generally, the parapets are of earth, and the passage open overhead·

but sometimes caponnières are vaulted galleries of brick-work, loopholed at the sides for musketry, while in field-works, pallisade caponnières are occasionally thrown across the ditches of redoubts.

For a notice of the connecting-links between various defense-works, see FORTIFICATION. Annexed is a plan of what is called a *front* of fortification, illustrating many parts elsewhere described under their several titles. ASF is one half of a *bastion;* BGH, one half of another bastion; AS, BG are *faces* of the bastions; SF, GH are the *flanks;* A and B are *salient angles;* S and G are *shoulders;* F and H are *re-entering angles;* FH is the *curtain* between two bastions; PN is the caponnière, stretching across the main ditch from the curtain to the ravelin N; the white space on which the letters XA*m*SV*yz*GB stand is the *ditch;* ORE is the *covert* or *covered-way;* R is the *place of arms;* S′, S′ are *sally-ports* cut through the *glacis;* X, *r*, *n*, V, *y*, and *z*, are *traverses;* WUW′ is a *flèche,* outside a salient angle of the glacis; OU is a second caponnière, leading to the flèche, with a traverse at O; E, T are a traverse and a caponnière leading to a redoubt supposed to be beyond the glacis; a line in the direction UA would describe the *capital* of one of the bastions.

CAPOT, n. *kă-pŏt′* [F. *capot,* designating a play at cards, foolish: Ger. *caput.* ruined]: a winning of all the tricks of cards at the game of piquet: V. to win at piquet. CAPOT′-TING, imp. CAPOTTED, pp. *kă-pŏt′ĕd.*

CAPOTE, n. *ka-pōt′* [F. Sp. *capote*—from L. *capa,* a cloak]: a long cloak or mantle reaching to the feet, worn by women; a coat with a hood, worn by soldiers, sailors, etc.

CAPOUCH, n. *kă-pôch′:* see CAPOCH.

CAPPADOCIA, *kăp-pa-dō′she-a:* anciently a province, subsequently a kingdom, in the w. of Asia (in part the present Caramania). It was bounded by Lycaonia on the w., by Cilicia and Syria on the s., by Armenia on the e., and by Pontus on the n. During the time that it belonged to the Persian empire, however, it included Pontus, called Lesser Cappadocia. In A.D. 17, C. was erected into a separate province of the Roman empire, by Tiberius.

CAPPAGH BROWN, *kăp′pach:* a bituminous earth, which yields pigments of various shades of brown, the two most strongly marked being known as light and dark Cappagh brown. The coloring matters are oxide of manganese and iron. The C. browns are transparent and permanent; and when not applied too thickly, they dry well in oil. The name is derived from Cappagh, near Cork, Ireland. C. B. is also called encrome mineral, and more frequently, manganese brown.

CAPPARIDEÆ, *kăp-păr-ĭ′dē-ē,* or CAPPARIDACEÆ, *kăp-păr-ĭ-dā′sē-ē:* nat. ord. of exogenous plants, allied to *Cruciferæ,* and including about 350 known species, herbaceous plants, shrubs, and trees, natives mostly of tropical and sub-tropical countries. The leaves are generally alter-

nate, stalked, undivided, or palmate; the flowers solitary or clustered; the calyx of four sepals, sometimes cohering in a tube; the corolla of four, or sometimes eight petals, sometimes wanting, the stamens generally a multiple of four, or indefinitely numerous, placed on a hemispherical or elongated disk; the ovary one-celled, the style thread-like or wanting; the ovules curved; the fruit either dry and pod-like (tribe *Cleomeæ*), or a berry (tribe *Cappareæ*). —To this order belongs the well-known caper-bush: see CAPERS. Many of the species possess stimulant properties; some are poisonous. One of the most interesting plants of the order is the Siwâk (*Capparis sodata*), a bush or small tree, one of the most characteristic features of the vegetation of Africa, from the Great Desert to the Niger, the small berries of which have a pungent taste like pepper, and when dried, constitute an important ingredient in the food of the inhabitants of those regions; while the roots when burned yield salt.—*Barth's Travels.*

CAPPEL, *kâp-pĕl':* village of Switzerland, canton of Zurich, 10 miles s.s.w. of the city of Zurich; interesting as the place where the great reformer Zwinglius was killed in a conflict with troops of the Rom. Cath. cantons, 1531, Oct. A monument has been erected here to his memory.

CAPPING VERSES, *kăp'pĭng* [Icel. *kapp*, contention (see CAP)]: in *familiar language*, contending in the citation of verses. TO CAP, to beat one: see under CAP.

CAPREOLATE, a. *kăp'rē-ŏ-lāt* [L. *capreŏlus*, tendril of a vine, a wild goat]: in *bot.*, having tendrils.

CAPRERA, *kâ-prā'râ*, or CABRERA, *kâ-brā'râ:* one of a group of small islands called the Buccinari Islands, in the Strait of Bonifacio, to the e. of the n. point of Sardinia (q.v.). They belong to the Italian province of Sassari. C. is separated from the coast of Sardinia by a strait of little more than a mile in breadth, and by a similar narrow strait from the island of Maddalena to the w. Its greatest length, from n. to s., is about six m., and its breadth two to three m. Like Maddalena and the rest of the Buccinari Isles, and the neighboring coast of Sardinia, C. is rocky, bare, and unfertile. It has no streams, and is in few places adapted either for the pasture of cattle or for the plow. In former times it was the abode only of wild goats—whence its name (L. and It. *capra*, a goat)—and rabbits, and was occasionally visited by goat-herds and fishermen. It has of late years acquired celebrity as the ordinary residence of Garibaldi, who acquired a property and built a house here 1854. The rest of the island was bought by friends, and presented to him some years after. Here he for the most part lived, save when on his military expeditions, or discharging his functions as a member of the Italian legislature at Rome. It was to C., his own beloved home, that he was sent by the Italian government in 1867, after his unfortunate attempt to overthrow the papal government; and here, 1882, June 2, he died.

CAPRI, *kâ'prē* (anc. *Capreæ*): charming island in the Mediterranean, at the entrance of the Bay of Naples, about

three m. from Cape Campanella, 20 m. s. of the city of Naples. On its small area of about 11 m. circumference, it displays a rich variety of beautiful scenery, ruins of antiquity, and points of historical interest. The island is composed of two mountain masses, separated from each other by a depression like the seat of a saddle. That on the w. called Monte Solaro, which is the highest and largest, has an elevation of about 1,900 ft. The e. part is not more than 860 ft. above the sea. Pop. of the island (1881) 4,539.

At the base of the e. mountain is the town of C., built on a shelving rock, and guarded by walls, gates, and drawbridges, with a cathedral. It commands a beautiful prospect, and communicates with the little town of Anacapri, on the western table-land, by a flight of 535 rude steps, cut in the face of the rock. There are only two safe landing places on the island, and these are at the town of Capri, and near it. C. was a celebrated place, in the times of Augustus and Tiberius. Ruins are still found of Roman baths and aqueducts, and of the twelve grand villas or palaces built in honor of the twelve chief deities by the Emperor Tiberius, who passed the last ten years of his life here in the practice of the grossest licentiousness and cruelty. The inhabitants now consist of fishermen, sailors, and a few traders, with vine-dressers and cultivators of olives in Anacapri. Wherever a tree can be planted, the hopeful and industrious people have prepared for it a soil by persevering toil in terrace-culture. Delicious quails, which in vast numbers alight on the island during their migrations to and from Africa, in spring and autumn, are taken in nets, and form an important item in the resources of Capri. Pop. of town, including its district, abt. 4,000.

To the w. of the town of C. is situated the *Grotta Azzurra* (Blue Grotto), a remarkable cavern, entered from the sea by a narrow opening not more than three ft. high. Inside, however, it is of magnificent proportions, and of marvellous beauty, the georgeous coloring being said to be due to the reflection and refraction of the sun's rays through the water. Elliptical in form, it has a length of 165 ft., a breadth of 100 in the widest part, and a height of 40 in the loftiest, with 48 ft. of water beneath.

CAPRIC, a. *kăp'rĭk* [L. *caper*, a he-goat]: obtained from butter, or the butter and fat of the goat. CAPRIC ACID, a rank-smelling fatty substance found in butter, cocoa-nut, etc., whose flavor is very sour and burning. CAP'RATE, n. *-rāt*, a salt of capric acid. CAPRIN, n. *kăp'rĭn*, one of the fats found in butter. CAPROIN, n. *kăp-rō'ĭn*, and CAPRYLLIN, n. *kăp-rĭl'ĭn*, fats found in butter. CAPROIC ACID, one of the fatty acids with an odor of the goat. CAPRYL'LIC ACID, an acid found, as well as the preceding, in rancid butter, cheese, cocoa-nut, etc.: see CAPROIC ACID.

CAPRICCIO, n. *ka-prē'chō* [It.]: in *Shakes.*, the Italian word used for CAPRICE (q.v.). *Capriccio* in *art* is a term applied to a picture or other work which designedly violates the ordinary rules of composition. Foliated orna

ments, with Cupids or other figures appearing in them in situations not strictly natural, are capriccios. *Capriccio* in *music*, is a species of free composition, without being subject to rule as to form or figure. Locatelli, at the beginning of the 18th c., composed capriccios for the violin. The most celebrated C. of modern times is Mendelssohn's B. minor C. for pianoforte and orchestra.

CAPRICE, n. *kă-prēs'* [F. *caprice*, whim—from It. *capriccio*, a shivering, a whim—from L. *capra*, a goat: comp. It. *capo*, head; *rezzo*, an ague-fit]: sudden and slight desires to do or possess, as the starts in a shivering, or the capers of a goat; a sudden change of opinion or humor; a whim; a particular fancy. CAPRI'CIOUS, a. *-prĭsh'ŭs*, given to change; whimsical; fickle; apt to change opinions or intentions suddenly. CAPRI'CIOUSLY, ad. *-lĭ*. CAPRI'CIOUSNESS, n. fickleness in desires, feelings, fancies, or opinions. —SYN. of 'caprice': humor; whim; freak; fancy; fickleness; variableness; changeableness: vagary; — of 'capricious': arbitrary; whimsical; unsteady; captious; freakish: queer.

CAPRICORN, n. *kăp'rĭ-kawrn*, or CAPRICORNUS [L. *caper*, a goat; *cornu*, a horn], the *Goat:* a southern constellation, and the tenth sign of the zodiac (q.v.); denoted by the sign ♑, representing the crooked horns of a goat. It is usually represented on the globe as having the forepart of a goat, but the hinder part of a fish (see fig.). It is one of the least striking of the zodiacal constellations. It was, how-

Capricornus.

ever, celebrated among the ancients, who regarded it as the harbinger of good-fortune, and as marking the southern tropic or winter solstice, wherefore they called it the 'Southern Gate of the Sun.' It contains no large stars, the two largest, situated in the horns, being of the third magnitude. Neither of these rises above the horizon above n. lat. 50°. TROPIC OF CAPRICORN, the parallel of the s. hemisphere, whose latitude is equal to the sun's greatest declination, about 23° 28′. See TROPICS.

CAPRID, a. *kăp'rĭd* [L. *caper*, a he-goat]: relating to the goat tribe. CAP'RINE, a. *-rĭn*, pertaining to a goat.

CAPRIDÆ, *kăp'rĭ-dē:* family of ruminant quadrupeds, which, as defined by some naturalists, may be described as the *Sheep and Goat* family, including the Linnæan genera *Ovis*, sheep (q.v.), and *Capra*, goat (q.v.); but which is extended by others to include antelopes, their persistent horns being regarded as the great distinction between them and the *Cervidæ*, or deer family. In the more restricted sense the name designates a very natural family, yet differing from the *Bovidæ* or ox family more in general appearance than in other characters; while links of connection with the antelopes are not wanting, a very remarkable one being found in the prong-horn of America.

CAPRIFICATION, n. *kăp'rĭ-fi-kā'shŭn* [L. *caprificārĕ*, to ripen figs by the stinging of the gall insect; *caprificus*, the goat or wild fig—from *caper*, a he-goat; *ficus* a fig]: method long employed in the Levant for securing and hastening the ripening of figs, and which consists in suspending fruit-bearing branches of the wild fig above or beside those of the cultivated tree. The notion once entertained, that this practice is analogous to that by which the fecundation of the female palm-tree is secured, is inconsistent with the now well-known fact, that the fig has both male and female flowers within its own receptacle; and it is therefore supposed that the effects of C. may result from the agency of a species of insect, of which the eggs have been deposited in the early wild figs, and which may promote fecundation by entering the receptacle of the cultivated fig, or perhaps by puncturing it may cause it to ripen sooner. In hope of a similar advantage, some French and English cultivators have inserted into figs straws dipped in olive oil. But C. is scarcely practiced in western Europe, and has even been discontinued as unnecessary in some parts of the east where it formerly prevailed.

CAPRIFOLIACEÆ, *kăp-rĭ-fō-lĭ-ā'sē-ē:* nat. ord. of exogenous plants, consisting of shrubs and herbaceous plants, which have opposite leaves without stipules, and flowers disposed in corymbs, in heads, or in whorls. The calyx is 4–5 cleft; the corolla monopetalous, tubular, or wheel-shaped, sometimes irregular. The stamens are adherent to the corolla at its base, and alternate with its lobes. The ovary is free, 1–5-celled. The fruit is generally a berry, sometimes dry, but not splitting open when ripe. The order is very nearly related to *Cinchonaceæ*, differing chiefly in the want of stipules. More than 200 species are known, natives chiefly of the temperate and colder parts of the n. hemisphere. To this order belong the honeysuckle, elder, viburnum, and snowberry. Emetic and cathartic properties are prevalent in it.

CAPRIMULGIDÆ, *kăp-rĭ-mŭl'jĭ-dē:* family of birds, of the order *Insessores*, and tribe *Fissirostres*, nearly allied to the *Hirundinidæ* or swallow tribe, but differing from them in the still greater width of gape, and in having long, stiff bristles at the base of the bill. They are insectivorous birds

They have very long wings, short legs, and toes united at the base by a membrane. The European goatsucker may be said to be the type of the family which includes also the whip-poor-will and night-hawk of America, with many other species widely distributed over the globe, and now arranged by naturalists in a number of genera.

CAPRIOLE, n. *kăp′rĭ-ōl* (see CAPER]: a leap which a horse makes without advancing; a leap or caper, as in dancing: V. to leap without advancing. CAP′RIO′LING, imp. CAP′RIOLED, pp. *-ōld.*

CAPRIVI DE CAPRERA DE MONTECUCCULI, *kâ-prē′-vē dā kâ-prā′râ dā mōn-tā-kôk′kô-lē*, GEORGE LEO VON: soldier: b. Berlin, 1831, Feb. 24, d. 1899, Feb. 6. His father was descended from an illustrious Italian family, and held a high legal office in Prussia. The son was educated at the Werder Gymnasium; entered the Kaiser Franz grenadiers as 2d lieut. 1849; was promoted 1st lieut. 1850; capt. 1859; aide to Gen. Slosch 1861; maj. 1866; lieut.-col. and chief of staff of the 10th corps 1870; col., chief of dept., and gen. of staff 1872; maj.-gen. 1877; and lieut.-gen. 1882. He served with distinction in the Prussian campaigns of 1864 and 66; won high honors as chief of staff of the 10th corps at Metz, Orleans, and the following Loire campaign in the Franco-German war; became commander of the 30th corps at Metz 1882; and was appointed by Emperor William I. chief of admiralty and rear-admiral of the new German navy 1883. He completed the reorganization of the navy 1889, and was restored to the army and given command of the 10th corps, with headquarters at Hanover. Up to this time his life had been wholly spent in the milit. service, excepting the period in which he was reorganizing the navy, and he had never been concerned in public affairs. His naval administration showed him to be an officer of high executive power and rare adaptability. Emperor William II. was greatly attracted toward him during the autumn maneuvers 1889, and when he accepted the resignation of Prince Bismarck (q.v.) as chancellor of the empire 1890, Mar., he appointed Caprivi his successor. Personally Caprivi was a large, robust man, bearing such a remarkable resemblance to the "iron chancellor' that he might readily pass for his brother. He was very deliberate in gait and speech, and used few words. The new chancellor opened the Prussian diet 1890, Apr. 15, in a speech expressing his undying belief in the future of Prussia and of the German empire resting on Prussia's shoulders, and declaring that he would allow the widest scope to practical criticism, and would adopt what was good wherever it was found. He pledged himself to coöperate with all persons having at heart the interests of Prussia and aiming to foster the monarchic feeling in Prussia and the national feeling throughout the empire. He resigned his office, 1894, Oct. 26.

CAPROIC, *kăp′rō-ĭk*, and CAPRYLLIC, *kā-prĭl′lĭk*, and CAPRIC ACIDS, *kăp′rĭk* (see CAPRIC); represented by the formulæ $C_{12}H_{12}O_4$, $C_{16}H_{16}O_4$ and $C_{20}H_{20}O_4$: members of the acetic or fatty-acid series. They all may be obtained

from butter by pressing out the portion which remains liquid at 60°, saponifying this oil, and distilling the soap which is thus formed with sulphuric acid. The liquid which passes over contains these three acids, together with butyric acid, which, by being converted into baryta salts, are separable from one another. All three of these acids are obtained also by the oxidation of oleic acid by nitric acid; and capric acid is also obtained by acting upon oil of rue with fuming nitric acid; hence it is frequently called *rutic acid.*

CA′PRON, Allyn, American soldier: b. Tampa, Fla., 1846, Aug. 27; d. Fort Myer, Va., 1898, Sept. 18. He was graduated at West Point 1867, and entered the 1st Artillery, receiving his captaincy 1888, Dec. 4. During the Sioux campaign of 1890 he made a brilliant record at the battles of Wounded Knee and Drexel Mission. During the war with Spain, 1898, he opened the fight at El Caney, Cuba, and shattered the first flagstaff in Santiago. During this campaign he was taken ill with typhoid fever, and succumbed to its attack. He was a fine mathematician, and a recognized authority on artillery and tactics. His father, Erastus Allyn Capron was killed at Cherubusco, in the Mexican war, 1847, Aug. 20.

CAPRYL, n. *kăp′rĭl* [L. *caper*, a he-goat; Gr. *ulē*, matter of which a thing is made]: the radical of capric acid. Capryl′ic acid, an acid obtained from butter, cheese, yeast, etc. Capryllin, n. *kăp′rĭl-ĭn*, a fat found in butter. Cap′rylyl, n. *-rĭ-lĭl*, the radical of the capryllic series: see under Capric.

CAP′SICIN, *kăp′sĭ-sĭn*, a name given to two apparently different substances. One described by Braconnot, obtained from chilli pepper, is an acrid oil or oleoresin, of a reddish-brown color, the vapor of which excites sneezing and coughing. It is probably a mixture of different bodies. The other is a resinoid substance obtained from cayenne pepper; it is brown with a golden tint, has the consistence of tar, an aromatic smell and pungent taste and is used in America as a powerful stimulant in influenza, fever, indigestion, and other disorders, and externally as a rubefacient. Quite recently a volatile alkaloid has been obtained from chilli pepper, by first removing the acrid resin, then making the fluid alkaline, and extracting with petroleum spirit. On evaporating, a substance is produced with an odor like that of conia. It is distinguished from conia and nicotine by a variety of reactions.

CAPSICUM, n. *kăp′sī-kŭm* [new L. *capsĭcum*—from L. *capsa*, a box, a chest]: red or Cayenne pepper, from Cayenne in French Guiana, of different species and varieties, ord. *Solanācĕæ*. Capsicine, n. *kăp′sĭ-sĭn*, an alkaloid, the active principle in the capsules of Cayenne pepper, obtained in the form of a reddish oleaginous substance of exceeding acridity.

CAPSICUM, *kăp'sĭ-kŭm:* genus of plants of the nat. ord. *Solanaceæ,* having a wheel-shaped corolla, projecting and converging stamens, and a dry berry. The species are all of a shrubby, bushy appearance, and have more or less woody stems, although they are annual or biennial plants. The number of species is very uncertain, some botanists distinguishing many while others regard them as mere varieties of a few. They are natives of the warm parts of America and of Asia, have simple leaves, and rather inconspicuous flowers, and some of them are in very general cultivation in tropical and sub-tropical countries for their fruit, which is extremely pungent and stimulant, and is employed in sauces, mixed pickles, etc., often under its Mexican name of *Chillies;* and when dried and ground, forms the spice called *Cayenne pepper.* As a condiment, it improves the flavor of food, aids digestion, and prevents flatulence. In tropical countries, it counteracts the enervating influence of external heat. In medicine, it is used as a stimulant, rubefacient, and vesicant; is often administered in combination with cinchona; and is particularly valuable both internally administered and as a gargle, not only in relaxed conditions of the throat, but in some of those diseases in which the throat is most dangerously affected. As a medicine, C. is administered in *pills* mixed with bread; in the form of *tincture,* obtained by digesting the bruised C. in alcohol; or of an *infusion,* procured by digestion in water, with varying proportions of salt and vinegar. A gargle of C. is prepared by infusing it in water, with candy-sugar and vinegar, and thereafter adding a little infusion of roses. It has no narcotic properties. It owes its power chiefly to *Capsicine* (q.v.). Cayenne pepper consists chiefly of the ground seeds. *C. annuum,* sometimes called Common C., or Chilly Pepper, is perhaps the most common species in cultivation. There are several varieties of it. The fruit is used either ripe or unripe, except for making Cayenne pepper, for which ripe fruit is employed. The fruit brought from S. America is sometimes sold by druggists under the name *Guinea pepper.*

CAPSIZE, v. *kăp-sīz'* [probably *cap,* top, head; and *seize:* Sp. *cabeza,* the head, or *cabecear,* to incline to one side: comp. Scot. *coup,* a fall—*lit.,* to pitch head foremost]: to throw head downward; to upset; to overturn. CAPSI'ZING, imp. CAPSIZED', pp. *-sīzd'.*

CAPSTAN, n. *kăp'stăn* [Sp. *cabrestante,* a capstan: old Sp. *cabra,* an engine for throwing stones: It. *capra,* an engine to raise ordnance]: on *shipboard,* ponderous mass of timber (or smaller in size of iron), whose uses are to heave the anchor, hoist up masts and guns, take in and discharge cargo, etc. It has very firm supports on the deck underneath it. It comprises a *barrel,* round which a rope or a chain coils; *whelps,* or pieces of timber, which enlarge the diameter without greatly increasing the weight; the *drum-head,* a polygonal flat piece of timber at the top, pierced laterally with holes; the *step,* or lowest part, which rests

upon and is bolted to the beams; the *saucer*, an iron socket let into the top of the step, the *pivot* or *spindle*, which, resting on the saucer, forms the axis around which the C. turns; the *pawls*, short bars of iron, to prevent the reaction of the C.; *bars*, which enter the holes, and are the levers for enabling the sailors to work the C.; *pins*, placed vertically through the drum-head, for temporarily retaining the bars in their places; and the *shifter*, a rope connecting the outer ends of the bars. Among many improvements made in the arrangement and action of capstans is Wardill's, for increasing the bite or holding of a chain-cable around the circumference. In large vessels capstans are generally worked by steam.

CAPSULE, n. *kăp'sūl* [F. *capsule*—from L. *capsŭla*, a little chest—from *capsa*, a chest]: a covering for the corks or stoppers of bottles for the more effectual exclusion of air; a small smooth thin box, round or oval, made of some neutral and easily-soluble substance, for inclosing bitter or otherwise disagreeable medicines, to facilitate the swallowing of them; in *bot.*, the seed-vessel of a plant, usually applied to a dry, many-seeded fruit; in *anat*, a membraneous bag inclosing an organ; in *chem.*, a china saucer for roasting. CAP'SULAR, a. *-lĕr*, or CAP'SULARY, a. *-lĕr-ĭ*, hollow; full of cells. CAPSULATE, a. *kăp'sū-lāt*, or CAP'SULATED, a. *-lā-tĕd*, inclosed in a capsule, or as in a box.

CAP'SULE, *kăp'sūl*, in Botany: a dry fruit, *syncarpous* (or formed of several carpels united together into one), and opening either by valves, as in the fox-glove, primrose, and rhododendron, or by pores near the summit, which some regard as a sort of valves, and of which beautiful examples may be seen in the poppy and snapdragon. Capsules are either one-celled or many-celled. The *Pyxidium* is a variety of C., which opens as if cut around near the summit, presenting the appearance of a cup with a lid, of which a very beautiful example may be seen in the *Anagallis*, or Pimpernel; and another in the great woody fruit of the different species of *Lecythis* and other *Lecythidaceæ*.

CAPTAIN, n. *kăp'tĭn* [F. *capitaine;* It. *capitano*—from mid. L. *capĭtānĕŭs*, a military chief—from L. *căput*, the head]: an officer who commands a company of foot, a troop of horse-soldiers, or a ship; a leader or chief. CAPTAIN GENERAL, the commander-in-chief, as of an army, or sometimes a province. CAP'TAINCY, n. *-sĭ*, the rank or commission of a captain. CAP'TAINSHIP, n. the condition, rank, or authority of a captain; chieftainship.

CAPTAIN, *kăp'tĭn*, or *kăp'tān*, MILITARY: the most general designation given to an officer of land forces; something equivalent to it being found in most European languages. *Captain-general* is in some countries a very high command. In the time of Queen Elizabeth, there was among other high English military officers, a cap.-gen. of footmen. In the organization of the British army at the present day, there is one C. to every *company* of infantry and every *troop* of cavalry. Formerly every bat-

tery of artillery had two captains—a first and a second, the latter being called C.-lieut. Now, the first in command has the title of major, and the second that of C. The first in command of a battery of artillery, even when styled C., was considered higher than a C. of infantry or cavalry, and was privileged to be mentioned by name in military despatches like colonels and majors.

The duty of the C. is to see to the men of his company in everything that relates to discipline, exercises, billeting, pay, settlement of accounts, mess, kit, clothing, arms, ammunition, accoutrements, stores, barracks, cooking, etc.; to receive orders concerning these matters from the major, and to enforce these orders among the men. He is responsible to the major, and is assisted in his duties by the lieut. and sub-lieut.—in the U. S. army, the first and second lieuts. For the former value of a British C.'s commission, and its purchase, see COMMISSIONS, ARMY: PURCHASE SYSTEM.

The position and duties of a C. in the U. S. army are much the same as in the British service. A C. ranks next above a lieut. and next below a major.

CAPTAIN, NAVAL: general designation for the commander of a ship. It is not universal, for some vessels of war are commanded by officers lower in rank than C.; while the chief officer of a merchant-vessel is often called *master*. The commanders of all rated ships are captains. The captains rise to the command of larger and larger ships, with increase of pay, according to length of service. The C. is responsible for everything on shipboard, in discipline, navigation, equipment—all, in short, that concerns the *personnel* or the *matériel* of the ship. If his ship belongs to a particular fleet or naval station, he is responsible to some admiral or commodore; if not, he is directly responsible to the naval dept. The C. of that particular ship in a fleet which carries the admiral is called *flag-C.*, and is for the occasion higher in rank than others. A naval officer when not attached to a ship in actual commission is on half-pay. A C. in the U. S. navy ranks next below a flag-officer, and with a col. in the army.

The word C. is used in other ways also in the navy. The *C. of the fleet* is a temporary officer in large fleets; he promulgates the admiral's orders, and receives all the reports and returns, filling, in short, a post equivalent to that of *chief of the staff* in an army. Among the seamen on board a ship, the chief of each gang is called C.; such as the C. of the after-guard, of the forecastle, of the hold, of the main-top, of each gun, etc. There are also *captains of marines*, whose rank is with lieuts. in the navy and with C.s in the army.

CAPTION, n. *kăp'shŭn* [mid. L. *captĭōnem*, detention—from L. *capĭō*, I seize]: a title or heading; in *OE.*, a taking unawares by a trick; in *law*, the part of a legal writ which asserts its authority; less strictly in England, but properly in Scotland, an arrest: see INDICTMENT: COMMISSION: DILIGENCE: WARRANT: HORNING.

CAPTIOUS, a. *kăp'shŭs* [L. *captĭōsus*, captious, deceptive—from *capĕrĕ*, to take: F. *captieux*]: disposed to find fault; apt to cavil or raise objections; insidious. CAPTIOUSLY, ad. *-lĭ*. CAP'TIOUSNESS, n. disposition to find fault.—SYN. of 'captious': cavilling; censorious; carping; critical; peevish; insnaring; insidious.

CAPTIVATE, v. *kăp'tĭ-vāt* [L. *captīvus*, taken prisoner—from *capĕrĕ*, to take; *captus*, taken: F. *captiver*, to enslave]: to take prisoner; to charm or subdue by beauty; to gain by excellence in manners or conduct; to enslave in love. CAP'TIVATING, imp.: ADJ. so pleasing and delightful as to enchain the judgment and affections; bewitching. CAP'TIVATED, pp. CAP TIVA'TION, n. *-vā'shŭn*. CAPTIVE, n. *kăp'tĭv*, a prisoner taken in war; one who is charmed by beauty or enslaved by love: ADJ. made prisoner in war. CAPTIV'ITY, n. *-ĭ-tĭ*, bondage; the state of being in the power of an enemy; state of being under subjection or control. CAP'TURE, n. *-tūr*, the act of taking or seizing by an enemy, as a ship; the thing taken; a prize; seizure, as of a criminal: V. to take or lay hold of by force; to seize by stratagem. CAP'TURING, imp. CAP'TURED, pp. *-tūrd*. CAP'TOR, n. *-tĕr*, one who seizes or captures, as a ship.—SYN. of 'captivate': to enchant; charm; fascinate; enrapture; enslave; subdue; overpower;—of 'captivity': imprisonment; confinement; incarceration; bondage; slavery; immuring; servitude; subjection;—of 'capture, n.': seizure; prize; detention; arrest.

CAPTURE, *kăpt'yūr*, in International Law: prize taken in time of war. The law on this subject is stated with precision in a paper addressed on behalf of the British government to the American ambassador at London, 1794, Sep.: 'When two powers are at war they have a right to make prizes of the ships, goods, and effects of each other, upon the high seas. Whatever is the property of the enemy, may be acquired by capture at sea; but the property of a friend cannot be taken, provided he observes his neutrality. Hence the law of nations has established—that the goods of an enemy on board the ship of a friend may be taken—that the lawful goods of a friend on board the ship of an enemy ought to be restored—that contraband goods going to the enemy, though the property of a friend, may be taken as prize; because supplying the enemy with what enables him better to carry on the war, is a departere from neutrality.'

During the Russian war in 1854, there appeared in the *London Gazette*, under date March 28, a declaration stating *inter alia*, that her majesty would waive the right of seizing enemy's property laden on board a neutral vessel, unless it be contraband of war, and that it was not her majesty's intention to issue letters of marque for the commissioning of privateers The right of seizing enemy's property on board a neutral vessel, whether contraband of war or not, had always before been maintained by England. On the re-establishment of peace with Russia, a treaty was signed, and the following declarations adopted: 1. Privateering is and

remains abolished; 2. A neutral flag covers an enemy's goods, with the exception of contraband of war; 3. Neutral goods, with the exception of contraband of war, are not liable to C. under an enemy's flag; 4. Blockades, in order to be binding, must be effectual—that is to say, maintained by force sufficient in general to prevent effectually access to the coast of the enemy.

As to the right to property captured from the enemy, and its distribution as prize or booty of war among the officers and men of the army and navy, see BOOTY: PRIZE: see also INTERNATIONAL LAW.

CAPUA, *kăp'ū-a:* fortified city of Italy, province of Caserta; beautifully situated in a rich plain, on the left bank of the Volturno, about 18 m. n. of the city of Naples, with which it is connected by railway. It is a military station of the first class, its defenses having been greatly extended and improved by Vauban. As it is the only fortress which guards the approach to Naples from the n., it was regarded as one of the keys of the former kingdom of that name. The only objects of interest in the city are the cathedral, with some splendid granite columns from ancient *Casilinum*, upon whose site C. was built in the 9th c.; the church of the *Annunziata*, with some bas-reliefs: and the arch of the *Piazza dei Giudici*, under which many ancient inscriptions still exist. Pop. 12,000.

The ancient *Capua*, which enjoyed a reputation for wealth and population second only to Rome and Carthage, was about two m. s. e. of the present city, where its ruins are still seen, its site being occupied by the modern town of Santa Maria di Capua. C. was founded by the Etruscans, under the name of *Volturnum*, as early, according to some authorities, as B.C. 800, and was the chief city of the 12 said to have been founded by them in this part of Italy. Its present name was derived from the Samnites, who captured it B.C. 423. After the battle of Cannæ, B.C. 216, the popular party opened the gates to Hannibal, whose army was greatly enervated by its luxurious winter-quarters here. The Romans obtained possession of the city B.C. 211. In the 5th c., after Christ, C. was devastated by the Vandals under Genseric. It partially recovered its prosperity, but was totally destroyed by the Saracens 840. The citizens, who had fled to the mountains, were induced by their bishop to return, some 16 years later, and found the modern Capua. From the existing remains of the walls and fortifications of ancient C., it has been estimated that it had a circumference of 5 or 6 m. It had seven gates. Among the Roman antiquities, one of the most remarkable is the amphitheatre, built of bricks, and faced with white marble. Well-preserved arches, corridors and seats for spectators, remain. It is calculated to have been capable of holding 60,000 persons, and must have been altogether one of the most magnificent buildings of the kind in Italy.

CAPUCHIN, n. *kăp-ū-shēn'* [F. *capucin*—from *capuce*, a cowl—from It. *cappuccio*, a cowl (see CAP)]: a monk belonging to a branch of the order of St. Francis (see FRAN-

CISCANS), designated from the *capuche*, which is their head-dress; their rule is mainly the same as that of the Minorites. Their founder and the superior of their first convent, was Matthew de Bassi, a Franciscan of Ancora, and they were authorized 1528, by Pope Clement VII. They have made many converts, and had, by recent reports, more than 80 missions in Europe, Asia, Africa, East Indies, and S. America. They have establishments in New York, New Jersey, and Wisconsin. C. is the name of a cloak and hood for females; also a kind of small monkey.

CAPUCHIN MONKEY, *kăp-ū-shēn' mŭng'kĭ*, or CAPUCHIN SAPAJOU, *kăp ū-shēn' săp'a-jō:* name often given to *Cebus capuchinus*, and some other species of the genus *Cebus*, S. American monkeys, which have the head covered with short hair, so disposed as to resemble the cowl of a capuchin, the face being almost naked, or covered only with a little

Capuchin Monkey (*Pithecia Chiropotes*).

down: see CEBUS. *Pithecia chiropotes*, a S. American monkey of a genus allied to *Cebus*, is also sometimes called the C. M., or Capuchin of the Orinoco.

CAP'UDAN-PASHA': see CAPITAN-PACHA.

CAPULETS AND MONTAGUES, *kăp'ū-lĕts and mŏn ta-gūz:* English spelling of the names of the Cappelletti and Montecchi, two noble families of n. Italy, memorable chiefly from their connection with the legend on which Shakespeare has founded his play of *Romeo and Juliet*. According to tradition, both families belonged to Verona; but this does not appear historical. The Cappelletti were of Cremona, and the fact that their burying-ground and the tomb of Juliet are shown at Verona, only proves how easy it is, in a country of ruins like Italy, to connect fact with fable. It has also been asserted that one family was Guelph and the other Ghibelline; but this is disproved by a reference to them in the *Purgatorio* of Dante (canto vi. l. 106). The poet is blaming the Emperor Albert for neglecting Italy, the very

garden of his domain. 'Reckless man,' he says, 'come see how the Montecchi and the Cappelletti are oppressed;' and the context shows that the Guelphs were the oppressors in both cases of these great Ghibelline families. The Emperor Albert was murdered in 1308, and this event has supplied the Veronese with a date for their legend. The first publication in which we recognize the essential incidents of Shakespeare's play is the novel *La Giulietta*, by Luigi da Porto, printed 1535, after the death of the author. He states, in an epistle prefixed to the work, that the story was told him 'by one Perigrino, a man fifty years of age, much experienced in the art of war, a pleasant companion, and, like almost all the Veronese, a great talker.' In 1554, Bandello published in his collection of tales another Italian version of the legend. It was entitled *The unfortunate Death of two unhappy Lovers, the one by Poison and the other of Grief.* Both writers fix the date of the event by saying it took place when Bartholomew della Scala or Scaliger ruled Verona. A French version of the tale was published by Pierre Borsteau in Belleforest's *Histoires Tragiques.* It was translated into English 1567, and published in Painter's *Palace of Pleasure.* About the same time, Arthur Brooke published an English poem on the same subject, entitled *The Tragical History of Romeus and Juliet, written first in Italian by Bandell, and now in English.* There is evidence that an English play had appeared previously, and that before Shakespeare's time the story was so well known in England that it had supplied subjects for tapestries. Shakespeare's play seems to have been based principally on the English poem. It was Brooke who first called the Montecchi Montagues, and the Prince of Verona Escalus, instead of Scala. Wright and Cary, in translating Dante, have followed the example of Shakespeare, and render the Italian names of the *Divina Commedia* into the familiar 'Capulets and Montagues' of *Romeo and Juliet.* The historical date of the tragedy has not, however, been adopted by modern stage managers and Shakespearian critics, who very properly bring down the action from the beginning to the close of the 14th c., when commercial opulence, and the revival of arts and letters, supply accessories more in keeping with the drama than the ruder age to which history must assign the fall of the Capulets and Montagues.

CAPUT MORTUUM VITRIOLI, *kā'pŭt mawr'tū-ŭm vĭt-rī'ō-lī*, or COLCOTHAR, *kŏl'kŏ-thâr*: name given by the alchemists to the red powder (mainly red oxide of iron) which remains in the retorts when green vitriol or the sulphate of iron is calcined.

CAPYBARA, n. *kă-pī'bă-ră* [native name], (*Hydrochœrus Capybara*): quadruped of the order *Glires* or *Rodentia*, and of the family *Cavidæ*, strongly resembling the cavy or Guinea-pig, although it is the largest existing rodent known, and aquatic in its habits. It is a native of S. America, and abounds in many of the large tropical rivers. It is equal in size to a small pig. The dentition resembles that of the cavy, except that the grinding teeth are composed of numerous

transverse plates, the number of the plates increasing as the animal advances in age; an interesting point of resemblance to the dentition of the elephant, and a link of connection between the rodents and the pachydermata. The C. feeds exclusively on vegetable food, browsing on the grass near the rivers, and often committing great ravages in plantations of sugar-cane. It runs badly, but swims and dives

Capybara (*Hydrochœrus Capybara*).

well, and has the power of remaining under water seven or eight minutes. It is very inoffensive, and easily tamed. The flesh, except that of old males, is good for food. The capybara is sometimes called water-hog, of which *Hydrochœrus* is a Greek translation. In Demarara it is called water-horse, a corruption of the Dutch *Water Haas*—i.e., water-hare.

CAR, n. *kâr* [OF. *car;* F. *char*, a car—from L. *carrus;* It. *carro*, a car, a cart: W. *car*, a raft, a frame: Dut. *karren*, to creak]: a small light carriage drawn by one horse; a railway carriage; a chariot of war or triumph; a large omnibus for street and road traffic whose wheels run in the grooves of iron rails; the cage of an elevator; the basket of a balloon. CAR'MAN, n. the driver or conductor of a car.

CARABIDÆ, *kâr-ăb'ĭ-dē:* tribe of beetles, or coleopterous insects, of the section *Pentamera* (see COLEOPTERA), corresponding with the genus *Carabus* of Linnæus, but of which the species are extremely numerous, those already known being numbered by thousands. They feed mostly on other insects, worms, etc., and are extremely voracious and active, habits which are fully shared by their larvæ. Some of them burrow in the earth; most of them live under stones, under the bark of trees, among moss, etc., and their bodies are adapted to this mode of life, being very firm and hard. Their legs are in general long and most of them pursue their prey rather by the use of their legs than of their wings, some of them indeed being wingless, or having only rudimentary wings. Many of them have much beauty of colors and metallic lustre.

Some of the species of the restricted genus *Carabus* are among the most common British insects. Their wings are

Mormolyce phyllodes.

not fitted for flight.—A very large and singular insect of the tribe C. is *Mormolyce phyllodes*, native of Java, which, in consequence of the extremely depressed form of its body, resembles some of the *Mantidæ* (q. v.), and the insects known as leaf-insects (q.v.). To this tribe belong also the bombardier beetles, which see.

CARABINE, n. *kâr'ă-bīn*, or CARBINE, n. *kâr'bīn* [F. *carabine*—from It. *carabina*, a rifle: mid. L. *calabrīnus*, a light cavalry from *Calabrĭă*]: a short gun carried by a cavalry soldier. CAR'ABINEER', or CAR'BINEER', n. *-bĭ-nēr'*, one who carries a carabine.

CARABOBO, *kâ-râ-bō'bō:* n. w. state or province of Venezuela, bounded on the n. by the Caribbean Sea, e. by Caracas, Aragua, and Guarico, s. by Portugueza, and w. by Barinas, Barquisimeto, and Coro; 2,984 sq. m. The n. part is mountainous, the s. level. C. has many streams and lakes, and is divided into seven cantons and 33 parishes. The climate is warm but not unhealthful. Agriculture and cattle-raising are chief occupations: coffee, cacao, sugar, indigo, hides, cotton, and tobacco are exported. The cap. and chief town is Valencia, the principal port Puerto Cabello. Pop. (1891) 198,021.

CAR'ABOU: see REINDEER.

CARACAL, n. *kăr'ă-kăl* [said to be Turk. *qarahqootaq*, black-ear], (*Felis Caracal*): species of lynx (q.v.), found in the warmer parts of Asia, and throughout Africa; and more probably than any European species, the lynx of the ancients. It is larger than a fox, about the same height, but much more powerful; of a uniform deep brown or wine-red color, except two spots near each eye, the under parts of the body, and inner parts of the legs, which are white, and tufts of long black hair which terminate the ears. The C. is powerful enough to tear a hound to pieces. It is often represented as of a very savage dispo-

sition; but it is capable of being tamed, and has been employed in hunting.

CARACALLA, *kar-a-kăl'la*, properly named Marcus Aurelius Antoninus Bassianus, Roman emperor; A.D. 188–217, Apr. 8; b. Lyon; son of the Emperor Septimius Severus. He was playfully named by his father Caracalla, from his long-hooded tunic, made in the fashion of the Gauls, and so called in their language. After his father's death, 211, he ascended the throne as co-regent with his brother Publius Septimius Antoninus Geta, whom he afterward caused to be murdered. Having bribed (at enormous cost) the Prætorians to overlook this foul deed, and to make him sole emperor, Caracalla next directed his cruelty against all the friends and adherents of Geta, of whom 20,000 of both sexes—including the great jurist Papinianus—were put to death. Innumerable acts of oppression and robbery were employed to raise supplies for the unbounded extravagance of the despot, and to pay his soldiers. In his famous constitution, he bestowed Roman citizenship on all his free subjects not citizens—who formed the majority, especially in the provinces—but simply in order to levy a greater amount of taxes on releases and heritages, which were paid only by citizens. In his campaigns, he imitated, at one time, Alexander, at another time Sulla, while his main object was to oppress and exhaust the provinces which had been in a great measure spared by the tyranny of former emperors. He was assassinated, at the instigation of Macrinus, prefect of the Prætorians, by one of his veterans named Martialis, on the way from Edessa to Carrhæ. Historians paint the life of Caracalla in the darkest colors. Among the buildings of Caracalla in Rome, the baths—Thermæ Caracallæ—near Porta Capena were most celebrated, and their ruins are still magnificent.

CARACARA, *kâ-ra-kâ'ra*, or Caracara Eagle (*Polyborus*): genus of birds of prey peculiar to America, regarded as a connecting link between eagles and vultures; agreeing with the former in their strongly-hooked bill and claws, but with the latter in their naked face and propensity to prey on carrion. The name caracara, originally Brazilian, is derived from the peculiar hoarse cry of a common Brazilian species (*P. Braziliensis*), a bird of very fine plumage, about 50 inches in expanse of wings, which is of frequent occurrence over a large extent of the American continent, and is sometimes seen in the southern United States.

CARACAS, *kârâ'kâs:* district of Venezuela, extending in n. lat. from 7° 38′ to 10° 46′, and in w. long. from 65° 30′ to 68°. With a generally mountainous interior, the immediate coast is flat, presenting, besides La Guayra, several harbors or roadsteads. Exports are cocoa, coffee, dyewoods, hides, indigo, and sarsaparilla. Pop. 300,000.

CARACAS: capital of the republic of Venezuela, most northerly state in S. America; with Guiana on the e.

and Colombia on the w.; lat. 10° 30′ and long. 67° 5′ w., 16 m. s. of La Guayra, its port, with which it is joined by railway. It is 2,880 ft. above tide-level, which elevation gives it healthful air and a temperature so moderate as to average 68° F. in Feb., and 72° in June. Standing immediately above the confluence of four streams, it is well supplied with cool water, distributed by means of fountains, pipes, and reservoirs. The neighborhood is subject to earthquakes—12,000 citizens having, in 1812, perished from this cause. The streets are straight and regular. The most splendid edifice is the church of Alta Gracia, for the people of color, excelling the cathedral in the richness of its decorations. Caracas has a university founded 1778. Pop. 90,000.

CARACCI, *kâ-rât′chē* or CARRACCI, *kâr-rât′chē:* celebrated family of Italian painters, founders of the Bolognese school of painting.

LUDOVICO C.: 1555–1619: b. Bologna; son of a butcher. As a student he was so inapt that his master recommended him to abandon the pursuit; but instead, he went to Venice and Parma, making acquaintance with the works of the great masters there, and returned to Bologna imbued with art principles quite opposed to the superficial mannerism prevailing in his native city. In conjunction with two of his cousins, who, instructed by him, had imbibed the same ideas, he founded, in spite of great opposition, the school which afterward became so famous in the history of painting. The first principle of this new school was that 'observation of nature ought to be combined with imitation of the best masters.' The allied artists found numerous pupils, to whom they gave practical instructions in drawing from natural and artistic models, with theoretical lessons on perspective, anatomy, etc. So great was their success that, in a short time, all other schools of painting were closed in Bologna. Some of the finest works of this master are preserved in the *Academia delle Belle Arte,* Bologna—among others, the *Madonna and Child Throned, Madonna and Child Standing,* the *Transfiguration,* and the *Nativity of St. John the Baptist.*

AGOSTINO C.: 1558–1602; b. Bologna; cousin of Ludovico Caracci. He became a disciple of his cousin, but he was too versatile a genius to devote himself closely to any subject, though his magnificent painting of the *Communion of St. Jerome* shows that he might have attained great eminence had he given undivided attention to the art; but he was in the habit of abandoning his easel for literature, poetry, and engraving on copper. As an engraver, indeed, he holds an important position in Italian art.

ANNIBALE C.: 1560–1609; b. Bologna; brother of Agostino. He learned, under his father, the business of a tailor, from which he was called away by Ludovico Caracci. His progress in the study of painting was rapid, and at first he took principally for his models Correggio, Titian, and Paul Veronese. His picture of *St. Roche distributing*

Alms, first gained for him wide reputation. His fame reached Rome, and he was employed to paint the Farnese Gallery there, which is considered his greatest work, and the manner of which partakes somewhat of Raphael and Correggio. On this gallery he was employed some eight years, and he received for his work the incredibly paltry sum of 500 crowns. In disgust and vexation, the artist threw aside his palette. He died in Rome, where his remains were interred close to Raphael's tomb, in the Pantheon.

ANTONIO C.: 1583–1618; b. Venice; natural son of Agostino, pupil under Annibale C.; painted some excellent pictures.

FRANCESCO C. (styled FRANCESCHINI): 1595–1622; brother of Agostino and Annibale C.; eminent designer.

The best Italian masters of the 17th c.—Domenichino, Guido Reni, Albani, and others—proceeded from the school of the Caracci.

CARACCIOLI. *kâ-rât'cho-lē* or *kâ-rât-cho'lē:* Neapolitan family, unfortunately associated with the memory of Lord Nelson. Several members of this family were employed in political offices.

LOUIS ANTONIO DE C.: 1721–1803; b. Paris; author of a pseudograph, entitled *Lettres Interessantes du Pape Clement XIV.*, which mystified many readers throughout Europe.

FRANCESCO C.: meritorious Neapolitan admiral, entered in early life the marine service, and distinguished himself at Toulon, 1793. In the year 1798, the offensive conduct of the court of Naples toward C. induced him to return from Palermo, where the court was then residing, to Naples, where he entered into the service of the republic established by the French invaders, and, with a few vessels, prevented the attempted landing of a Sicilian and British fleet. In 1799, when Ruffo took Naples, C. was arrested, contrary to the terms of the capitulation, sentenced to death by the junta, hanged on the mast of a frigate, and his corpse thrown into the sea. This affair, to which Lord Nelson was a consenting party, is a stain on the reputation of the English admiral.

CARACK n. *kăr'ăk*: a Spanish or Portuguese type of ship.

CARACOLE, n. *kăr'ă-kōl* [F. *caracole*, a gambol—from Sp. *caracol*, a winding staircase: Gael. *car*, a twist: AS. *cerran*, to turn]: the half-turn which a horseman makes to the right or left, sometimes performed repeatedly by a cavalry troop in charge to mislead the enemy as to the point of attack; in *arch.*, a winding staircase.

CARACTACUS, *ka-răk'ta-kŭs:* King of the Silures, who inhabited South Wales 1st c. He was one of the most persistent enemies of the Romans in Britain. For nine years he warred gallantly against the invaders, but at length was completely overthrown. His wife and daughters fell into the hands of the victors, and his brothers surrendered.

Caractacus fled to Cartimandua, Queen of the Brigantes, who delivered him up to the Romans. He was carried to Rome, A.D. 51, and exhibited to the people by the emperor Claudius. When he approached the imperial seat, we are told, he addressed Claudius in so noble a manner that he and his relatives were immediately pardoned. They appear, however, to have lived during the remainder of their lives in Italy.

CARADOC BEDS, *kâr′ă-dŏk*, also BALA BEDS, in *Geology:* the upper member of the Lower Silurian system, so named from their development at Caer Caradoc, Shropshire. They consist of sandstones, grits, and slates, with occasional beds of limestone. Enormous masses of contemporaneous igneous rocks are interstratified with them. They attain a thickness of 9,000 ft., not including the igneous rocks. Fossils are very abundant in some beds, chiefly Trilobites (q.v.), Brachiopoda (q.v.), and Graptolites, which see.

CARAFE, n. *kăr-ăf′* [F. *carafe*—from It. *caraffa*, a decanter]: a glass water-bottle or decanter for the table or toilet.

CARAGEEN, or CARRAGEEN, n. *kăr′ă-gēn*: Irish moss or pearl moss; a name in Ireland for the sea-weed *Chondrus crispus*, ord. *Algæ*, used when dried for feeding cattle, and as a nutritious article of diet: see CARRAGEEN.

CARAITE, n. *kărā-īt′* [Rabbinical Hebrew, *kharai*, textual]: one of a Jewish sect who reject the Cabala, the Talmud, and all traditions, holding to the books of the ancient canon alone; also spelled KARAITE: see JEWISH SECTS.

CARAMAN′IA: see KARAMAN.

CARAMBOLA, *ka-răm′bō-la*, or *kar-am-bō′la:* East Indian fruit of the size and shape of a duck's egg, but with five acute angles, or longitudinal ribs. It has a yellow, thin, smooth rind, and a clear watery pulp, in some varieties sweet, in others acid, of very agreeable flavor. It is often used in making sherbets, and in tarts and preserves; and is known to the British in India as the *Coromandel Gooseberry.* It is one of the most universally cultivated and abundant fruits of India. It is produced by the *Averrhoa Carambola,* a small evergreen tree, or bush, of the nat. ord. *Oxalideæ.* The BILIMBI, or BLIMBING, is the very acid fruit of another species of the same genus, *A. Bilimbi,* also East Indian. Both species are now much cultivated in tropical America. Both exhibit an irritability of leaf resembling that of the sensitive plant; they also display in a remarkable degree the phenomena known to physiologists as those of Sleep of Plants, which see.

CARAMBOLE, n. *kăr′ăm-bōl*; [F.]: the same as CAROM.

CARAMEL, n. *kăr′ă-mĕl* [F. *caramel*—from Sp. *caramelo*, sugar-candy]. When sugar is gradually heated it loses water and other substances, and is converted into a dark mass with a characteristic smell and taste. This is

crude caramel, which is used in cookery as a coloring and flavoring ingredient. It is a mixture of several bodies, of which three have been described: Caramelane, a brown, bitter body; soluble in water; Caramelene, a dark brown body, also soluble in water, and possessed of great tinctorial power; and Caramelin, a black substance, of intense coloring power, which exists both in a soluble and insoluble modification. Caramel is likewise formed during the roasting of all materials containing sugar, such as coffee, chicory, and malt (see BEER), and is one cause of the dark color of porter and infusions of coffee. It is used in the coloring of whisky, wines, vinegar, etc.

CARAMNASSA, *kârâm-nâs'sâ:* river in the presidency of Bengal, which rises in lat. 24° 34′ n., long. 83° 46′ e., and, after a course of about 150 m., enters the Ganges from the right in lat. 25° 28′ n., long. 83° 58′ e. Though, on issuing from its source, it is clear as crystal, it is said to be both nauseous and noxious—a peculiarity which the natives impute to various supernatural causes. About 50 m. from its mouth it is crossed by a stone bridge of three wide arches which forms part of the grand road from Calcutta to Delhi. It is so exceptionally subject to floods that it has been known to rise 25 ft. in a night, when scarcely any rain had fallen in the adjacent plain of the Ganges itself.

CARANA RESIN, *ka-râ'na*, or *ka-răn'a*, *rĕz-ĭn*, more commonly, but less correctly, called GUM CARANA: resinous substance procured in tropical America. Its properties and uses resemble those of tacamahac. It is entirely soluble in alcohol, and melts in a slight heat. It is not known what tree produces it.

CA'RANX: see SCAD.

CARAPA, *kăr'a-pa:* genus of plants of the nat. ord. *Meliaceæ*, natives of warm climates. *C. Guianensis*, or *guareoides*, sometimes called the Anderaba, also the carapa tree, is a large tree with beautiful shining pinnate leaves which have many leaflets, native of Guiana and the adjacent countries, where its bark has great reputation as a febrifuge, and the oil obtained from its seeds is much used for lamps. Masts of ships are made of its trunk. The oil, called oil of carapa, is thick and bitter, and is anthelmintic.—*C. Touloucouna*, or *Guineensis* an African species, yields a similar oil, used by the negroes for making soap, and for anointing their bodies, its bitterness protecting them from the bites of insects, a purpose to which the oil of carapa is also applied in S. America.—These species are very similar, and are supposed by some botanists not essentially distinct.

CARAPACE, n. *kăr'ă-pās* [F. *carapace*—from Sp. *cara: pacho*—from Gr. *karbos*, a crustaceous animal like the crab or lobster]: the crustaceous and horny coverings of chelonian reptiles (tortoises and turtles), and of the *Crustacea Malacostraca* (crabs, lobsters, etc.); strictly the

upper half of the shell of such animals, the lower being the plastron. In animals so widely different, however, there is only a general similarity in the appearance and the purpose of the carapace; its organic relations are very different: see CHELONIA; CRUSTACEA.

CARAT, n. *kăr'ăt* [F. *carat*—from It. *carato*, a carat-Ar. *kirat*, a small weight; *kuara*, name of the *Erythrina Abyssinica*, or coral-tree, an African plant whose beans were used as weights for gold]: weight commonly used for weighing precious stones, and particularly diamonds. According to some authorities, the name comes through the Arabic *qirrat* from the Greek *keration*, the fruit of the Carob (q.v.) or locust tree (*Ceratonia siliqua*) used as a weight.

Goldsmiths and assayers divide the troy pound, ounce, or any other weight, into 24 parts, and call each a carat, as a means of stating the proportion of pure gold contained in any alloy of gold with other metals. Thus, the gold of British coinage and of wedding-rings, which contains $\frac{22}{24}$ of pure gold, is called '22 carats fine,' or 22 carat gold. The lower standard used for watch-cases, etc., which contains $\frac{18}{24}$ of pure gold, is called 18 carat, and so on. The carat used in this sense has therefore no absolute weight; it merely denotes a ratio. This, however, is not the case with the carat used for weighing diamonds, which has a fixed weight, equal to $3\frac{1}{6}$ troy grains, and is divided into quarters, or 'carat grains,' eighths, sixteenths, thirty-seconds and sixty-fourths. These carat grains are thus less than troy grains, and therefore the jeweler has to keep a separate set of diamond weights. Even the carat with fixed weight varies in various countries—from about 216 milli grams in Leghorn to 195 in Florence. In England, it is 205.4090 milligrams; in France, 205.5000.

CARAUSIUS, *ka-raw'zĭ-us*, Emperor of Britain: d. 293 or 294. He was a Menapian, i.e., member of a confederation about the mouth of the Rhine; became 'count of the Saxon shore and admiral of the northern seas', and under the names of Marcus Aurelius Valerius C. was apparently recognized as a third Augustus by Diocletian and Maximian. The natives of Britain invited him, 286, to the sovereignty of that island, which he delivered from the depredations of Saxons and Frank pirates. He reigned for seven years there and in the Low Countries, destroyed two Roman fleets, chased the Picts and Scots into the highlands, rebuilt the wall of Severus, erected on the Carron a trophy which stood until the 18th c., established at Stourbridge a fair which still exists, and connected the Humber and Peterborough rivers by a dike or canal which drained the Lincolnshire fens. His history is gathered largely from coins, designed with ability unusual in that age by artists whom he invited to Britain. He was assassinated at York by his minister Allectus.

CARAVAGGIO, *ka-rȧ-vȧd'jō:* town of n. Italy, province of Bergamo, about 24 m. e. of Milan. In the principal church are some esteemed paintings by Campi, and C. is noted as the birthplace of the painters, Polidoro Caldara

and Michael Angelo Merighi, both surnamed Caravaggio. In the neighborhood is a sanctuary of the Madonna, built from designs of Pellegrini (1575). Pop. abt. 7,000.

CARAVAGGIO, Michael Angelo Amerighi or Merighi da: 1569–1609; b. Caravaggio, in Lombardy, n. Italy: Italian painter. His father, a mason, employed him in making paste for the fresco-painters, and in this way the artistic genius of the boy was stirred. After studying the works of the great masters in Milan and Venice he went to Rome, where he lived in poverty. At length a picture of his attracted the notice of Cardinal del Monte, who patronized the young artist, but the ferocious and quarrelsome character of C. soon involved him in difficulties. Having fled from Rome to Malta, on account of manslaughter, he obtained the favor of the grand-master by painting an altar-piece in the church of St. John, and other pictures. His quarrelsome nature soon forced him to flee from Malta; and in making his way back to Rome he was wounded, lost all his baggage, caught a violent fever, and on reaching Porto Ercole, lay down on a bank and died, at the age of 40. Trueness to nature was the object aimed at by C., who left all schools and devoted himself to paint life as he found it in lanes, alleys, and other resorts of the lower classes. He studied no such matters as refined sentiment or elevation of realities, but gave in his paintings expression to his own wild and gloomy character. One of his best paintings, *The Fraudulent Gamblers*, is preserved in the Sciarra Gallery, at Rome. His shadows are deep, his backgrounds very obscure; in consequence of which the whole picture seems to possess a mysterious greatness, that is very imposing. Even Rubens confessed that C. was his superior in chiaro-oscuro. When he painted sacred subjects he remained falsely faithful to the low realities of Italian life, so that several of his pictures painted for churches had to be removed from their places, because they could not be harmonized with sacred associations. Kugler, the German critic, has justly said of one of C.'s most celebrated works, a *Burial of Christ*, that it appears 'like nothing better than the funeral of a gypsy-chieftain.'

An earlier Italian painter of less eminence, Polidoro Caldara da Caravaggio, was born 1495, and murdered 1543.

CARAVAN, n. *kăr'ă-văn'* [F. *caravane*, formerly a convoy of soldiers for the protection of a company of merchants on a trading journey—from Sp. *caravana:* Pers. *kerwan:* Ar. *qairawan*]: a large, close carriage; in the East, a company, commonly merchants, journeying together for mutual safety. Caravans are often composed of great assemblages of travellers which, at stated times, traverse the deserts of Asia and Africa. A C. sometimes has more than 1,000 camels, which follow each other in single file, so that it may be a mile or more in length. The most celebrated caravans are those formed by pilgrims going to Mecca, particularly those which annually assemble at Cairo and at Damascus. The latter consists of 30,000 to 50,000

pilgrims, and is under the special protection of the Turkish sultan. The caravan by which the Persians travel to Mecca starts from Bagdad, and is the vehicle of a very important trade. The great Indian caravan to Mecca, which started from Muscat, has been long given up. Mecca, upon the arrival of the caravans, bringing goods from so many different parts of the world, presents all the appearance of a vast fair. The trade between Tripoli and the interior of Africa is carried on exclusively by caravans; likewise that between Darfur and Egypt. The great trade between Russia and China is also a caravan trade. In the East, caravans in which the camels have a load of 500 or 600 pounds are called *heavy* caravans; *light* caravans are those in which the camels have only half that weight, so that the daily journeys may be longer. *Heavy* caravans travel from 17 to 18 m. a day; *light*, from 22 to 25. The caravans are generally conducted with great regularity, and assemble at and start from stated places on stated days. The leader of the Mecca-caravans is called Emir-el-Hadsch, i.e., Prince of the Pilgrims. In trade-caravans, a leader called Karwan-Baschi, is elected by the merchants from their own number.

Among the knights of Malta, caravans meant the troops of knights appointed by the order to serve in garrisons, and also the cruises of their galleys against the Turks.

CARAVANCES: see CHICK PEA.

CARAVANSARY, n. *kăr'a-văn'sė-rĭ*, or CARAVAN'SERA, *-sė-ra*, or CARAVAN'SERAI, *-sė-rĭ* [*caravan*, and Pers. *sarai*, a large place], also KHAN: in the East, a sort of unfurnished inn to provide travellers with shelter. Those in towns and cities, which are generally built for traders, with a small sum charged for a day's sojourn, are handsomer and more convenient—having doors to the apartments—than those on the roads or outside the cities. They commonly consist of a square building of four wings built round a courtyard, in which the beasts of burden may be inclosed, and where there is usually a well of water; the lodgings are small rooms, about 7 or 8 ft. high, which surround the courtyard, and are bare of every article of furniture.

These caravansaries are an institution of very ancient date, being the 'inns' of Gen. xlii. 27, xliii. 21; and it was in the stable of such a place, there being no room for his parents in the lodging apartments, that Christ was born (Luke ii. 7). They belong either to government, to some private individual, or are the property of the church (mosques); those in towns or cities require payment from travellers, but not more than two or three Turkish piastres a day; those on the road are usually free. There are some large and very handsome caravansaries at Cairo, Damascus, Beyrout, Aleppo, etc. The steward or keeper of a C. is called a *caravanseraskier*.

CARAVEL, n. *kăr'ă-vĕl*, or CARVEL, *kâr'vĕl* [F. *caravelle*—from It. *caravela*, a kind of ship: Gael. *carbh*, a ship]: a small French herring-vessel: a light vessel formerly used by Spaniards and Portuguese: see CARVEL.

CARAWAY, n. *kăr'ă-wā* [Ar. *karwiyá-a*, caraway-seeds: F. and It. *carvi*—said to be from *Caria* in Asia Minor: but rather Gr. *karon;* L. *carĕŭm*, the caraway; *Carum carŭī*, the plant], (*Carum carui*): plant of the nat. ord. *Umbelliferæ*, growing abundantly in meadows and rich pastures in the middle and s. of Europe, and in parts of Asia, naturalized and cultivated in other countries also, for its aromatic seeds—in botanical language, *carpels*—which are used medicinally as a carminative and tonic; and are also much used as an aromatic condiment, and by confectioners, distillers, and perfumers. They depend for their aromatic properties on the volatile oil of C., obtained by bruising C. seeds, and distilling them with water. It is at first limpid and colorless, but becomes yellow, and subsequently brown by keeping. Oil of C. is used medicinally to relieve flatulence, and to correct the nauseating and griping ten-

Caraway.

dencies of some cathartic medicines; also in the preparation of *Spirit of C.*, and *C. Water* —Spirit of C., which may be prepared either by dissolving the oil of C. in proof-spirit, or by distilling bruised C. seeds together with proof-spirit, is much used in Russia and Germany as a liqueur (*Kümmelbranntwein*), sweetened with sugar.—C. has a branching stem 1–2 ft. high, with finely divided leaves, and dense umbels of whitish flowers. The fruit is oblong, each carpel having five thread-like ribs, with a single *vitta* (see UMBELLIFERÆ) in each of the interstices. The white carrot-shaped root of C. is sometimes used like carrots or parsnips, but has a very strong flavor.—C. has a great enemy in the CARAWAY MOTH (*Hæmylis Daucella*), the larva of which destroys both its stem and flowers.

CARBAMIC, a. *kâr-băm′ĭk* [made up from *carbon* and *ammonia*]: denoting a monobasic acid, resulting from the action of ammonia on carbonic anhydrite. CARBAMIDE, n. *kâr′bă-mīd*, another term for *urea*.

CARBAZOTIC, a. *kâr′bă-zŏt′ĭk* [*carbon*, and *azote*]: applied to an acid which consists of carbon, nitrogen, and oxygen. CARBAZOTIC ACID, or PIC′RIC ACID, of great importance in dyeing, is obtained by the action of strong nitric acid and heat on many complex organic materials, such as silk, indigo, salicine and a variety of resins. On a commercial scale it is obtained best from the oil of tar, which distils over from crude tar at between 300° and 400°, or from the resin of *Xanthorrhœa hastilis*. The hot nitric acid solution is strained from impurities and on cooling yellow crystals separate of carbazotic acid which can be purified by washing with cold water. These crystals are readily soluble in alcohol and ether, and dissolve in 80 or 90 times their weight of cold water, yielding a yellow solution, which has a very bitter taste, and stains the skin yellow; and when silk which has been treated with a mordant of alum, or cream of tartar, is immersed in a solution of carbazotic acid, it is dyed of a beautiful permanent yellow color. The bitter taste of carbazotic acid has led to its being fraudulently employed, instead of hops, in communicating a bitter taste to beer.

CARBIDES, *kâr′bīdz*, in chemistry, binary compounds of carbon with a metallic element, or with certain of the non-metallic elements. Of the known carbides those of iron and calcium are most important. Carbide of iron occurs in steel, and is undoubtedly concerned in some manner with the hardening of that metal; although the authorities are not agreed as to the precise role that it plays. Calcium carbide is formed by the action of carbon upon lime at the temperature of the electric furnace. It has the formula CaC_2, and its commercial value depends mainly upon the fact that it is readily decomposed by water, with the copious liberation of acetylene gas (q.v.). Carbide of magnesium is not formed at the temperature of the electric furnace, probably because it is not stable at that temperature. It may be prepared, however, by the action of calcium carbide upon magnesium fluoride. Like calcium carbide it is decomposed by water with evolution of acetylene gas, the yield being 50 per cent. greater, per pound of the carbide, in the case of magnesium carbide. It is not unlikely that magnesium carbide will one day replace calcium carbide for the production of acetylene gas, on account of the larger yield; but this substitution cannot be made on a commerical scale until some cheaper mode of manufacture is found. Gold, bismuth, lead, and tin do not form carbides at the temperature of the electric furnace, nor do they dissolve carbon at that temperature. Platinum and iridium dissolve carbon freely, but deposit it again, upon cooling, in the form of graphite. Aluminum absorbs carbon freely, with the formation of Al_4C_3, and similar results are obtained with many other

metals and metallic oxides. The carbides of titanium and of silicon are characterized by extreme hardness, and it is said that they will even cut the diamond with facility. Carbide of silicon is an exceedingly stable substance, and is now largely used, under the trade name of 'carborundum' (q.v.) as an abrasive material in the manufacture of grinding-wheels, whetstones, and polishing-cloth.

CAR'BINE [see CARABINE]: light kind of musket, named probably from the Carabins (see CARBINEERS). It is now used in Britain by the cavalry, the yeomanry cavalry, the Irish constabulary, and other corps. The best carbines are now rifled. A considerable number of American carbines, rifled and breech-loading, were purchased at a high price by the English government 1856. This American C. has a barrel only 22 inches in length, and a total weight of 7½ lbs. It is simple in construction, has a great range, hits a mark with accuracy, may be fired with rapidity, and requires little cleaning, smokeless powder being used in the manufacture of the cartridges. The muzzle velocity of the ammunition used in the modern carbine is about 1920 feet per second. See GUN; ORDNANCE; CANNON: etc.

CARBINEERS, or CARABINEERS: light cavalry, said to have derived their designation from the Arabs, among whom the *Carabins* or *Karabins* were light horsemen, stationed at outposts to harass the enemy, defend narrow passes, etc.; in action, they took the place of skirmishers. A corps under the same name was raised in France 1560; but the designation has not been much used in that country since the introduction of Hussars and Lancers. In the English army, carbineers was at one time a frequent designation for cavalry; but now only one regiment, the 6th dragoon guards, is known by this title; and the distinction between them and other cavalry is little more than nominal.

CARBINOL, n. *kâr'bĭn-ōl* [L. *carbōnem*, coal or carbon; *olĕŭm*, oil]: methylic alcohol or wood-spirit, a colorless, combustible liquid.

CAR'BO, CNEIUS PAPIRIUS: nephew of Caius Papirius Carbo, the Roman orator. He was a famous general and partisan of Marius; was elected consul B.C. 86; raised troops to oppose the advance of Sulla, and commanded the army against him at Clusium; was consul again after Sulla's return; was defeated at Faventia by Metellus; fled to Africa, and, while a prisoner, was put to death by Pompey's order, B.C. 82.

CARBOHYDRATE, n. *kâr'bō-hī'drāt* [L. *carbōnem*, coal; Gr. *hūdor*, water]: in chemistry, a compound consisting of carbon, hydrogen, and oxygen, and having the general formula $C_{6n}H_{2p}O_p$. As will be seen, the number of carbon atoms in a carbohydrate is always divisible by six, and the oxygen and hydrogen are present in the same proportion in which they occur in water. It is not implied, however, that the compound contains water as such, but only that

the oxygen and hydrogen atoms are present in the proportion of two atoms of the latter to one of the former. It will also be observed that a carbohydrate and a hydrocarbon are two essentially different things, inasmuch as a carbohydrate contains oxygen, while a hydrocarbon is a compound containing no element but carbon and hydrogen.

The carbohydrates constitute a large and very important class of substances, embracing the starches, sugars, glucoses, and gums. Their chemical relations are intricate, and are far from being thoroughly understood. Several schemes have been proposed for their classification, but owing to the present imperfection of our knowledge none is entirely satisfactory. They are exceedingly important elements in the world's food supply, and may indeed be said to be essential to the maintenance of life. They are practically all of vegetable origin, and are derived ultimately from certain simple fundamental substances that are formed in the green leaves of plants. Under the influence of sunlight the chlorophyll contained in the leaves is competent to split up the carbon dioxide of the air, retaining the carbon and setting the oxygen free. The carbon that is abstracted in this way is caused to combine with the water that the leaves contain, with the production of carbohydrates; but the identity of the carbohydrate that is first formed in this way, and which serves as the starting-point for the others, is not yet established. It seems likely, however, that formic aldehyde, CH_2O, is the first product, as is indicated by the equation

$$H_2O + CO_2 = CH_2O + 2O,$$

and that the subsequent products are built up by polymerization. In physiology, the carbohydrates are the chief sources of energy and heat in the body. Most of the carbohydrates are converted into maltose by the digestive processes. This, by the action of absorption and assimilation, becomes dextrose, which sugar is the only normal sugar of the circulating fluids and the tissues. The dextrose is taken up by the blood, conveyed to the liver by the portal vein and stored up in the liver cells. Some of the dextrose is also stored in muscle, and certain portions of it are utilized by the nucleoproteids of the body.

CARBOHYDROGENS, *kär'bō-hi-drō-jĕnz:* See HYDROCARBONS.

CARBOLIC ACID, *kâr-bŏl'ĭk* [*carbon,* and L. *oleŭm,* oil]: a colorless oily liquid obtained from coal-tar—called also *phenol* or *phenylic acid.* CARBOLINE, n. *kâr'bō-lēn,* a non-volatile hydrocarbon, may be used for increasing the illuminating power of coal-gas.

CARBOLIC ACID, or PHE'NIC ACID, or PHE'NOL (C_6H_6O): the principal acid obtained by distillation of coal-tar. Its strong odor and pungent taste, and many of its other properties resemble those of creosote (q.v.), similarly obtained from wood. It is a powerful poison, especially to low forms of life; and is slightly volatile.

Hence it is largely used as an antiseptic (q.v.) and disinfectant (q.v.). Its most important application is in Lister's method of dressing wounds. It is used also for rendering inoffensive sewage (q.v.), and for preventing the spread of infectious diseases.

Chemical and Physical Properties.—At ordinary temperatures a solid, in acicular crystals slightly volatile, C. A. becomes at 95° F. an oily liquid, specific gravity, 1.065; boiling point, 370° F. It does not affect a ray of polarized light, as creasote does; does not redden litmus paper; but coagulates albumen. A slip of deal dipped into it, and afterward into hydrochloric acid, and then allowed to dry in the air, acquires a greenish-blue color. With $\frac{1}{9}$ to $\frac{1}{4}$ its own volume of water, or fifteen times that volume or more, a solution is formed at ordinary temperatures; but between these limits a stronger solution separates from a weaker in oil-like globules. It is freely soluble in alcohol, ether, chloroform, glycerine, olive oil, and volatile oils.

Physiological Properties.—In *man*, when applied locally in dilute form, it acts as an irritant; in concentrated form, as a caustic; but it has also an anæsthetic action. When present in the blood in poisonous doses it produces disturbances of the circulation and respiration, insensibility, collapse, and death. Dangerous symptoms sometimes occur when it is very largely used in surgical dressings, owing to its absorption through wounds or through the skin, the first warning of which is an olive-green or black discoloration of the urine; may also cause gangrene of the tissues when applied as a dressing to wounds; therefore caution in its use should be exercised. On the micro-organisms which cause suppuration (see ANTISEPTICS; GERM THEORY) it has a destructive action. Hence it is used as a local application in treating offensive discharges and as a disinfectant in infectious diseases. It was formerly largely employed in the antiseptic treatment of wounds first practised by Lister.

CARBON, n. *kâr'bŏn* [It. *carbone;* F. *charbon* and *carbone*—from L. *carbōnem*, a coal]: pure charcoal; the chemical element known as charcoal, diamond, and graphite—less pure in coal, etc. CARBON'IC, a. *-ĭk*, or CAR'BONA'CEOUS, a. *-bō-nā'shŭs*, containing charcoal; coaly. CAR'BONATE, n. *-nāt*, a compound formed by the union of carbonic acid with a base, e.g.. carbonates of lime, soda, potash, iron, lead, copper, silver, etc.; they are easily decomposed by heat or by a more powerful acid. CAR'BONATED, a. combined or saturated with carbon. CAR'BONIF'EROUS, a. *-nĭfer-us* [L. *fero*, I carry]: producing carbon or coal; in *geol.*, one of the great palæozoic periods, or systems of stratified rocks. CAR'BONIZE, v. *-nīz*, to change into carbon. CAR'BONI'ZING, imp. CAR'BONIZED, pp. *-nīzd*. CARBONIZATION, n. *-zā'shŭn*, the act or process of carbonizing. CARBONOMETER, *kar-bŏn-ŏm'ĕ-tėr* [Gr. *metron*, a measure]: an instrument for detecting the presence of an excess of carbonic acid by its action on lime-water. CARBONIC ACID, a gas composed of one part of carbon and

two of oxygen; sometimes restricted to the hypothetical compound of this gas with water. CARBONATE OF LIME, limestone or chalk. CARBONIC ANHYDRATE, a gas forming the second component of chalk, *lime* being the first; same as carbonic acid.

CARBON: a non-metallic element, existing in nature in large quantities, both in the free and combined states, at least three distinctly different forms of it being known. These are (1) amorphous carbon; (2) graphite; and (3) diamond. Amorphous carbon is formed when wood or coal or almost any vegetable matter is heated strongly, out of contact with the air, and is familiar to everybody as charcoal, coke, and lampblack. Graphite (q.v.) occurs native, and may also be artificially prepared in various ways. Diamond (q.v.), which is crystallized carbon, also occurs native in certain regions, and pure specimens that are devoid of color, or which have certain special tints, are highly esteemed as gems.

Carbon has the chemical symbol C, and an atomic weight of 12.0 if O=16, and 11.91 if H=1. The specific gravity of diamond is 3.51, that of graphite is from 2.11 to 2.26, and that of hard gas-coke is about 2.35. The lighter varieties of carbon are very poor conductors of heat, graphite in mass has very considerable conducting powers. In the property of combustion there is a marked difference in the various forms of carbon. Wood-charcoal takes fire with the greatest readiness, bone-black less so; then follow in order of difficulty of combustion—coke, anthracite, lamp-black, black-lead, and the diamond. Indeed, black-lead is so non-combustible that crucibles to withstand very high heats for prolonged periods without breakage or burning are made of black-lead; and the diamond (q.v.) completely resists all ordinary modes of setting fire to it. In the property of hardness carbon ranges from the velvet-like lampblack to diamond. When carbon is ob-obtained of sufficient density, it is found to be a good conductor of electricity, and to make an excellent electro-negative element in a galvanic pair. Graphite displays these qualities to advantage, and so does the hard incrustation of carbon that is found sublimed in gas retorts. Coke, and wood-charcoal are too porous to possess them to any great extent. Diamond is a non-conductor. The scarcity of graphite, and the precarious supply of retort-C., preclude the possibility of obtaining much practical advantage from the electrical properties of carbon with these substances alone. We are indebted, however, to Prof. Bunsen, of Heidelberg, for the discovery of a process whereby a carbon of the requisite density can be manufactured with great ease and economy.

Carbon is infusible, and insoluble in any known liquid at ordinary temperatures. It dissolves to a limited extent in melted cast iron, and in melted platinum it dissolves freely, separating out again in the form of graphite upon cooling. It is unaltered by the action of acids, except when some powerful oxidizing agent like chlorate of

potassium or bichromate of potassium is also present. It combines with oxygen in two different proportions, with the formation of a monoxide CO, and a dioxide CO_2. It also forms, with hydrogen, a great number of compounds known as hydrocarbons (q.v.); and it combines with many of the metals to form carbides (q.v.). In coal it is found combined with hydrogen and oxygen; and in plants and animals it occurs as one of the elements building up wood, starch, gum, sugar, oil, bone (gelatine), and flesh (fibrine). Indeed, there is no other element so characteristic of plant and animal organisms, and it ranks as the only element never absent in substances obtained from the two kingdoms of organic nature.

CARBONADS. See DIAMOND.

CARBONARI, *kâr-bo-nâ′rī* or *kâr-bō-nâ′rē* [*literally*, 'colliers' or 'charcoal-burners']: secret political society, first, in some degree, made known in 1820. The constitution, like the precise objects of the Carbonari, still remains in a great measure secret; though they have printed instructions, catechisms, statutes, rituals, etc., for their associates. The statements respecting the high antiquity of this secret confederacy are fabulous. There is every reason to believe that it originated during the last French *régime* in Naples. Botta, in his *Storia d'Italia*, states that, under Murat's government, the Neapolitan republicans, equally hating the French and King Ferdinand, escaped into the wild defiles of the Abruzzi, and here, naming themselves 'Carbonari,' formed a secret society. It is said that their leader, Capobianco, had great powers of popular eloquence, and that their motto or war-cry was, 'Vengeance for the lamb torn by the wolf!'

The peculiar phraseology of the Carbonari is taken from the vocation of charcoal-burners. For instance, they are (or were) wont to speak of 'clearing the forest of wolves.' The 'wolves' probably meant, at first, foreign tyrants; but in the course of time, after the restoration of the Neapolitan Bourbons, such symbolical expressions had reference to *their* despicable misrule. Among themselves the initiated were styled 'good cousins.' The various societies do not seem to have had a common centre, or to have been properly organized for combined action. A place of meeting was styled 'a hut' (*baracca*); the external neighborhood, 'the forest;' and the interior of the hut was the *vendita* or 'place for selling coal.' A union of several of these huts formed a 'republic.' The superior huts (*alte vendite*) at Naples and Salerno endeavored, but without success, to effect a centralization of the Carbonari. The soc., soon after its institution, numbered 24,000—30,000 adherents, and increased so rapidly in Italy that, in 1820, March, it is said as many as 650,000 new members were initiated, including considerable numbers of the military and the clergy. The religious and Protestant character of the order is expressed in its statutes, which include the article: 'That every Carbonaro has the natural and unalterable right of worshipping God according to his own convic-

tions.' Though Carbonarism did not arise from the lodges of freemasons (as several have supposed), it has borrowed many forms of masonry.

After the restoration of the Bourbons, several secret political unions were formed in France, and in 1820 were confederated with the Carbonari. Paris, after the prosecutions against the secret societies of Italy, was made the headquarters of a Carbonarism, which, adopting all the symbolic phraseology, rules, and regulations of the Italian societies, received from the rapidly systematizing genius of the French, an organic character which it had never had before. The initiated styled themselves *bons cousins*, and spoke of the uninitiated as *pagani* (heathens). Written documents and communications were strictly prohibited by the heads of the union, and treachery was to be punished by assassination. After the close of the French and Spanish war, the Carbonari, whose activity in contriving plots had excited the terror of the French prefects, restricted its endeavors to the circulation of republican ideas, without direct attempts toward insurrection. After the July revolution several of the leading French Carbonari attached themselves to the new *régime*, and their society was gradually dissolved. In its place the new *Charbonnerie Démocratique* was founded, having for its object the establishment of a republican government, founded on the principles of Babeuf (q.v.). The endeavor of these new Carbonari to make Paris the centre of all political movements, led to the secession of the Italian refugees, who associated themselves under the title 'Young Italy.' French Carbonarism is not *known* to exist at present, and it is possible that even in Italy the triumphs of constitutional patriotism during recent times have rendered its existence no longer necessary, but it certainly was alive at the commencement of the Franco-Sardinian war with Austria; and one of the rumors of the time was, that the French emperor—who, in his young republican days, had been a member of this society—had entered on the war of liberation to conciliate his old associates, who had menaced him with the fate of a traitor.

CAR'BONATED, or ACID'ULOUS, WATERS: those which contain great excess of carbonic acid gas. The amount of gas in ordinary spring and well waters does not amount to more than 3–8 cub. in. in 100 cub. in. of the water; but in waters entitled to be called carbonated, the proportion of gas to 100 cub. in. of water rises to 30–60, when they are considered rich; and 100–200, when they are very rich. These waters sparkle when poured from one vessel to another. The carbonic acid is free, but is generally accompanied (1) by bi-carbonate of soda, when the water is called *carbonated-alkaline* or *alkaline-acidulous;* or (2) by bi-carbonate of iron, when the water is named *carbonated* or *acidulous-chalybeate:* see CHALYBEATE WATERS. The carbonated waters are very refreshing and exhilarating, and are useful in certain disordered states of the stomach; they relieve nausea, and generally increase the discharge of liquid from the system.

CAR'BON COM'POUNDS: in chemistry those compounds which contain the element carbon; and since carbon is an essential constituent of nearly all organic substances, the chemistry of its compounds is practically synonymous with 'organic chemistry,' which is now more correctly called the 'chemistry of carbon compounds.'

The carbon compounds form a group of great complexity, and are apparently unlimited in number. The reasons for this are that carbon is quadrivalent; that it forms multitudes of compounds with hydrogen alone, in many of which more or less of the hydrogen can be replaced by other elements, with the formation of new and altogether different substances; that its chemical bonds are apparently powerful; and that it unites with elements of the most widely different nature.

In a general way, the better-known carbon compounds are mostly divided into two great classes, according to the type of the 'graphical' or 'structural' formula that must be used in order adequately to represent their chemical relations. The first class includes all those bodies whose structural formulæ are distinguished by the fact that the atoms (or radicals) that are present form 'open' chains, which do not anywhere return into one another. These are called fatty compounds. The name was originally given because many of the substances that are included in the class have long been known in connection with fats and allied bodies; but it would be more logical to call them 'methane derivatives,' since they may be considered to be obtainable from the hydrocarbon methane, CH_4, by a process of substitution.

The second great class of carbon compounds is distinguished by the fact that the structural formulæ that are required in order to exhibit the chemical properties of its members return into themselves, so as to form 'closed' chains or rings, which (at least in the fundamental forms) contain six carbon atoms. Benzene is a familiar example. From the fact that many of the first known representatives were balsams, oils, and resins, these substances are known collectively as aromatic compounds. A better name would be 'benzene derivatives,' since all the members of the class are derivable from benzene by substitution.

In addition to the aromatic and fatty compounds, others are known which do not properly come under either heading, but which have not yet been classified on a similarly broad basis.

CARBONDALE, *kâr'bon-dāl:* city of Lackawanna co., (formerly in Luzerne co.), Penn.; incorporated 1851; on the Delaware and Hudson railroad, 17 m. n.e. of Scranton. A branch of the New York, Lake Erie and Western railroad connects it with the Erie railroad at Susquehanna Junction. It is at the head of the Lackawanna valley, which is rich in anthracite; the Delaware and Hudson Canal Co. works the mines, obtaining about 900,000 tons annually. The coal is drawn up inclined planes, carried by railway to Hones-

dale, and thence to the Hudson river by canal. Carbondale has 4 wards, 9 churches, 2 banks, and 2 newspapers. Pop. (1870) 6,393; (1880) 7,714; (1890) 10,833; (1910) 17,040.

CARBON DIOXIDE. See CARBONIC ACID GAS.

CARBON DISULPHIDE, *dī-sŭl'fīd*, or BISULPHIDE, *bī-sŭl'fīd:* CS_2, a liquid formed when the vapor of sulphur is passed over red-hot charcoal. Under normal conditions it is a very volatile, inflammable liquid, having a specific gravity of 1.29, and boiling at 115° F. The commercial disulphide has an exceedingly disagreeable smell, but this is due to the presence of impurities. The pure liquid has a pleasant, ethereal smell. Carbon disulphide (or bisulphide) does not mix with water, but it dissolves sulphur, phosphorus, caoutchouc, and many other organic bodies that are difficultly soluble in other menstrua, and it is to this property that it owes its commercial value. Since the use of rubber goods has become extensive, poisoning by carbon-disulphide is becoming quite prevalent, especially among the workers in rubber factories.

CARBONIC ACID GAS, CARBON DIOXIDE, or CARBONIC ANHYDRIDE: CO_2, is formed whenever carbon is burned in the presence of excess of oxygen or air. In preparing it for experimental purposes the usual method is to add a dilute mineral acid to pulverized marble or other carbonate, the carbon dioxide then being liberated continuously and in large quantities. It is a colorless, odorless gas about 1.53 times as heavy as air.

Under ordinary amospheric pressure, C. A. G. dissolves in water to the extent of 2 volumes of gas in 3 of water; but under increased pressure, a very much larger amount of gas is taken up by the water and in this way the various kinds of aërated waters (q.v.) are prepared. It is incombustible, and a non-supporter of combustion, at once extinguishing a lighted candle, gas jet, or even a piece of burning phosphorus, when these are placed in a jar filled with the gas, or even in a mixture of C. A. and air. It occurs in great abundance in nature, both free and in combination with various elements, in the form of carbonates. Carbonate of lime, $CaCO_3$, is one of the most common. It is also a constant constituent of the atmosphere (see AIR), occurring even at the tops of mountains and in the air collected from balloons. It is generated by the combustion of fuel, by respiration, by fermentation, and by the decay of animal and vegetable matter. In some localities, too, immense quantities of the gas are emitted from the ground, or from mineral springs and wells, as in the Grotto del Cane, the Cave of Montjoly in Auvergne, in the valley of Wehr, in the Eifel, and at many other places. It is being simultaneously abstracted from the air by plants, which in the sunlight decompose the gas, fixing the carbon that it contains, and setting the oxygen free. Poisoning by this gas frequently results in closed rooms crowded with people. The symptoms may be very slight, consisting of a mild indisposition, or they may be severe

—headache, nausea, vomiting, etc. In poisoning in the severer grades there is cyanosis, coma, and unconsciousness. Carbon dioxide alone is not a fatal poison; it is rendered so usually by the diminution of oxygen supply.

CARBONIC OXIDE, or Carbon Monoxide: CO, is produced in addition to the dioxide, when carbon is burned with a limited supply of air or oxygen. It is also generated by passing carbon dioxide through a red-hot bed of carbon, in accordance with the equation $CO_2+C=$ $_2CO$. For experimental purposes the gas may be generated by decomposing oxalic acid by heating it with strong sulphuric acid, and passing the gases that are evolved through a solution of caustic soda to absorb the carbon dioxide that is present. Carbon monoxide is colorless, and has a density about 0.97 times that of air. It burns with a lambent, blue flame that is often seen in coal fires that have been freshly supplied with fuel. It is exceedingly poisonous when inhaled.

CARBONIFEROUS LIMESTONE: see Mountain Limestone: also Carboniferous System.

CARBONIF'EROUS SYSTEM, in Geology: the strata which, in geological order, rest upon the Devonian measures, and are capped by the Permian series.

The rocks of the system are composed of a vast series of beds of sandstone, limestone, shale, and coal. In some coal-fields these are so interstratified, that it is impossible to subdivide the strata in the order of time. In the Edinburgh district, there are nearly 100 coal-seams, omitting all under 6 inches in thickness. Out of the whole depth of the strata, amounting to about 6,300 ft., these seams occupy only 204 ft. The remainder consists of sandstone and shale in the upper half; toward the middle, limestones appear, and these increase downward in the number and thickness of the beds, but are still intermixed with seams of coal. The same arrangement exists in the other coal-fields of Scotland, as well as of the n. of England. In other districts the limestone is confined to the lower portion of the measures, and separated from the coal-bearing strata, so as to form a natural subdivision of the system into—1. *The Coal Measures*, consisting of shale, sandstone, and grit, with occasional seams of coal; and 2. *The Mountain* or *Carboniferous Limestone*, a calcareous rock, containing marine shells and corals, and devoid of coal. A coarse quartzose sandstone, passing into conglomerate, is occasionally developed to a considerable extent between these two divisions. This is a local deposit, being almost confined to England, and may be considered as one of the coal-sandstones, of coarser texture than usual. Being occasionally used for millstones, it is called *Millstone grit*. Another locally-developed series of beds, consisting of indurated shales, sandstones, and grits, occurs below the carboniferous limestone in s. Wales and Ireland, and is known as the *Lower Limestone Shales*. These rest conformably on a series of yellow sandstones, which

nave been generally referred to the Devonian measures, but which, from their organic contents, as well as from their stratigraphical position, seem to be basement beds of the carboniferous series. The existence and development of these various beds in the United Kingdom will be better understood by an examination of the following table. The maximum thickness of the beds is given in feet when known; the blanks show the absence of the division from the particular coal-field:

	Edinburgh.	Glasgow.	No. York.	Derby.
Coal Measures . . .	6,300	2,800	2,000	2,700
Millstone Grit . . .	....	....	400	1,600
Mountain Limestone . .	....	....	1,659	1,000

	S. Wales.	Kerry.	Clare.	N Ireland.
Coal Measures . . .	12,000	2,000	2,000	2,200
Millstone Grit . . .	1,000	....	....	1,800
Mountain Limestone . .	1,500	1,500	3,000	6,400
Lower Limestone Shales	500	4,650	150	1,200
Yellow Sandstone . .	.....	3,000	unknown depth	2,000

In the midland counties of England the coal measures are the only portion of the carboniferous system present, and these rest on the Silurian or older rocks. In Devonshire occurs an extensive series of shales and sandstones, with a few beds of earthy anthracite or culm, associated with argillaceous rocks, probably belonging to the lower limestone shales, much indurated, and traversed by slaty cleavage.

From the great economic value of the contents of the C. S., we are better acquainted with its fossils than with any fauna or flora that flourished before the tertiary epoch. As coal is the result of the mineralization of vegetable matter, the coal measures must necessarily abound in the remains of plants. No less than 294 species have been described as found in Britain alone. Numerous impressions of plants, as well as traces of structure, are found in the seams of coal themselves; but the more distinct forms are preserved in the interstratified beds of mud and ironstone, often in great number and exquisite beauty. Such remains consist chiefly of impressions of leaves separated from their branches; of casts of trunks, more or less broken; and of roots much compressed, yet occupying their original position in the clay soil now indurated into shale; with these occur pieces of wood, or remains of trees, in which the vegetable texture is to some extent preserved. The great proportion of the plants seem to have flourished in marshes, and to have accumulated where they grew, like peat, the material afterward converted into coal. Hence a stratum of shale, in which are inbedded the roots of sigillaria, calamites, etc., is the invariable *floor* on which the coal seam rests. The chief coal plants are lepidodendron (q.v.), sigillaria (q.v.), calamites (q.v.), trigonocarpon (q.v.), and ferns (q.v.) The existence of cone-bearing trees during this epoch, has been proved from the microscopic examination of prepared sections of fossil woods in which the small discs occur that are characteristic of and peculiar to the coniferæ.

The animal remains are as numerous and as well preserved as the vegetable. They are found chiefly in the limestone; the greater part, indeed, of this rock, is made up bodily of corals and crinoids. No other such accumulation for extent and variety is known; it has its nearest parallel in the somewhat similar formation now going on in the Southern archipelago. The corals and crinoids were specifically as well as individually numerous. The terebratulæ and other allied forms of bivalve shells, though belonging to a comparatively limited number of genera, were very abundant. The more highly developed mollusca also were numerous; they belonged to a great number of generic types. But the most remarkable group was the fishes. At no period were they more abundant. They belonged to the Ganoid and Placoid groups of Agassiz. The ganoids, having their entire surface covered with scales, were numerous; some of them inhabited shallow water near the shore, and fed on crustaceans and shell-fish, for crushing which they had a formidable apparatus of conical teeth of a very complicated structure. Others were inhabitants of deep water, and were more powerful and predaceous, and more rapid in their movements. Their jaws were produced into a long snout, like the crocodile of the Ganges, and armed with a double series of enormous teeth, which were sometimes as much as four inches long by two inches broad, as in Megalichthys (q.v.), dimensions rarely attained even by the largest known reptiles. Associated with these were a great number of sharks belonging to the Cestraciontidæ (q.v.), a family of which there is only a single living representative. They were furnished with a long and bony spine to strengthen the dorsal fin, and thus enable them to turn speedily in the water, as they required to do in seizing their prey. These spines are often found fossil. The only remains referred to a higher division of the animal kingdom yet found belong to the saurian Archegosaurus (q.v.).

The C. S. underlies large portions of Penn., Ohio, Ill., Kans., Va., and other states. The total known area of this system which may be deemed productive of coal, throughout the world is estimated at 400,000 sq. m. See Anthracite: Coal: Paleontology.

CARBON PRINTING: see Positive Printing.

CARBORUN'DUM, a trade name for carbide of silicon, SiC. This compound is produced by heating sand and carbon together in the electric furnace. It is characterized by extreme hardness, and is used for abrasive purposes as a substitute for corundum and emery. It was discovered in 1891 by E. G. Acheson, and is now manufactured in large quantities at Niagara Falls. The production amounts to no less than 4,092 tons per annum. Carborundum in a fine form is placed on the market in considerable quantities as carbide of silicon for the introduction of silicon into iron, the material being very readily dissolved by the fused metal. Since carborundum is

infusible and is only oxodizable at extremely high temperatures in a large amount of free oxygen, it follows that the temperatures ordinarily generated for smelting of ores and metals are much below its point of destruction. Finely powdered carborundum is made up into a paste with sodium silicate or some similar binding substance; and the paste is applied by a brush or otherwise to bricks which are intended to be used for building a furnace, or the bricks are actually immersed in the viscous liquid for a certain time. If the furnace has already been built, the paste can be painted on the exposed surfaces. It is stated that a layer one-twelvth inch thick will protect the bricks from the attacks of the highest temperature that is ever produced by combustion methods in ordinary work.

CARBO-VEGETABILIS, n. *kâr'bō-vĕj'-ĕ-tăb'ĭl-ĭs* [L. *carbo*, coal; and new L. *vegetab'ilis*, vegetable]: a name for charcoal.

CARBOXYL, n. *kâr-bŏks'ĭl* [L. *carbōnem*, carbon; Gr. *ulē*, matter of which a thing is made]: the supposed radical of the organic acids; also called *oxatyl*.

CARBOY, n. *kâr'boy* [Turk. *karaboya*, black dye, copperas or green vitriol: Sicil. *carabba*, a bottle with a big belly and narrow neck]: a large globular bottle, generally covered with basket-work, employed for carrying acids.

CARBUNCLE, n. *kâr bŭng-kl* [L. *carbun'culus*, a little coal—from *carbo*, coal]: a red fiery round blotch on the skin, like a burning coal; an inflammatory boil; a precious stone of a deep-red color. CAR'BUNCLED, a. *-kld*, set with carbuncles; spotted with fiery red sores. CARBUN'CULAR, a. *-kū-ler*, pertaining to or resembling a carbuncle; red; inflamed. CARBUNCULA'TION, n. *-kū-lā'shŭn*, the blasting of the young buds of trees or plants, either by excessive heat or excessive cold.

CAR'BUNCLE: name given by lapidaries to the beautiful mineral called *Pyrope* (q.v.), by mineralogists. The C. of the ancients appears to have been either pyrope, or the deep-red variety of noble garnet (see GARNET), which is in every respect very similar to it; or probably it included both. The best usage at the present time confines it to the almandite garnet when cut *en cabochon*, that is, with a rounded convex surface. Usually such stones are hollowed out at the back and a piece of metal foil is inserted in order to lighten the otherwise too dense red color.

CARBUNCLE: an inflammatory boil; named from the two prominent symptoms—a glowing fiery redness, and a burning pain. It consists of an inflammation, caused by some vitiated condition of the blood, or some atmospheric influence, attacking a patch of skin on the shoulders, nape of the neck, or indeed any part of the body. The part swells slightly, feels hard, and this hardness extends deeply into the tissues; the pain is very severe, and the patient much depressed with loss of appetite and general derange-

ment of the secretions. As the disease advances, the redness assumes a dark purple or livid hue, the cuticle rises in blisters and many small specks of matter appear on its surface, which discharge, and leave apertures like those in the rose of a watering-pot; through this a thin viscid fluid escapes, and occasionally a small slough or core of the true skin which has been killed by the disease. Sometimes these apertures meet, forming large openings, and in others the whole patch of skin sloughs and comes away. The disease sometimes assumes a malignant and dangerous form.

The treatment of carbuncles consists in restoring the secreting organs to a healthy condition, the agents for which must depend on the individual case; in supporting the patient's strength by easily-digested food, wine, brandy, and, bark, with nitric acid; relieving pain by opiates, and encouraging suppuration with warm poultices, carrot, turnip, and yeast poultices being favorite applications. To prevent excessive loss of skin, the carbuncle must be divided freely with a knife from one marign of the inflamed patch to the opposite one.

CARBURET, n. *kâr'bū-rĕt*, or CAR'BIDE, n. *-bīd* [F. *carbure*—from L. *carbo*, a coal]: carbon in combination with some other substance, especially a metal, the result not being an acid: V. to combine some other substance with carbon. CAR'BURET'TING, imp. CAR'BURET'TED, pp.; ADJ. combined with carbon. CAR'BURET'TER, n. that which. CAR'BURA'TION, n. *-rā'shŭn*, the act of. CARBURETTED HYDROGEN GAS, a compound of carbon and hydrogen, such as common coal-gas.

CARBURETOR: an apparatus employed to increase the illuminating power of a gas, such as coal-gas, hydrogen, or air, by passing it over liquid hydrocarbon. All forms are practically similar in contruction, being designed to force the gas into contact with the hydrocarbon liquid held in a series of overflow pans, cylinders, or troughs formed of inclined plane bottoms dove-tailing into each other, and making a sinuous course through which the gas passes and emerges from the retort highly impregnated with the volatilized hydrocarbon vapor.

When employed for enriching gas, a poorer quality of coal may be used initially and the product thus obtained subsequently carbureted into a medium of a high illuminating power, and when gas is not available, air may be carburetted or saturated with the inflammable hydrogen vapor by passing it through the liquid and thus obtain a good illuminant.

CAR'BURETTED HY'DROGEN: term in chemistry applied to several compounds of carbon and hydrogen. Thus, light carburetted or mono-carburetted hydrogen (CH_2) is the gaseous compound popularly known as marsh gas and fire-damp, and is the principal constituent of coal-gas; see GAS. Heavy carburetted or bi-carburetted hydrogen (C_2H_2) is otherwise known as olefiant gas, which see.

CARCAJENTE, *kâr-kâ-hĕn'tâ* or *kâr-kâ-hĕn'tā:* town of Valencia, Spain, about 28 m. s.s.w. of the city of Valencia, on a rich plain near the right bank of the Juncar. It is well built, with good streets, and has a palace belonging to the Marquis of Calzada. It has some manufactures of linen and woolen, and a trade in the agricultural produce of the district. Pop. about 12,000.

CARCAJOU, n. *kâr'ka-jô* [F.]: the American badger (q.v.), *Meles labradorica,* a native of North America; also called the wolverine.

CARCANET, n. *kâr'kă-nĕt* [F. *carcan,* an iron collar—from OF. *quercant*—from Icel. *querk,* the throat]: a chain or necklace of jewels. Venice was famous for the manufacture of carcanets in the 15th century.

CARCANO, Giulio, *joo'lē-ō kâr-kâ'nō,* Italian poet: b. Milan, 1812; d. 1884. He wrote a narrative poem, *Ida Della Torre,* while a student at Pavia (1834). His next work, *Angiola Maria* (1839), had extraordinary success; it is a deeply sympathetic story of Italian family life, and is regarded as the highest type of that class in Italian. In the same vein is the volume *Simple Narratives* (1843). He wrote also *Damiano, the Story of a Poor Family* and other works. See Prina, *Giulio Carcano* (1884).

CARCASS, n. *kâr'kăs* [OF. *carquasse,* a dead body; F. *carquois,* a quiver: mod. Gr. *kar'kasi,* a quiver, a carcass: It. *carcasso,* a quiver, the hard core of fruits: Gael. *carcais,* a dead body]: the dead body of an animal; applied to the living body in contempt; the framework or principal parts of a thing unfinished, as a house. Carcass, or Carcasse, n. *kâr-kăs'* [F. *carcasse*—from It. *carcassa,* a bomb, a shell]: in *military pyrotechny,* a hollow case of iron, sometimes globular, sometimes ovate, filled with combustibles. It is fired from a mortar. Its chief use is to ignite buildings in the enemy's quarter, and to give sufficient light to aim the shot and shells. Carcasses are said to have been first sued by one of the princely ecclesiastics of Germany, the Bishop of Munster, when he fought against the Duke of Luxembourg at Groll, 1672. The oval carcasses, being uncertain in their flight, are now nearly abandoned. The round carcasses now made are chiefly those here indicated.

Diameter.	Composition.	Weight.
13 nch.	18 lbs.	213 lbs.
10 "	7 "	100 "
8 "	3 "	51 "
5 "	19 oz.	17 "
4¾ "	7 "	9 "

Carcasses are intended not to burst, but to send out, through holes, a furious and inextinguishable fire, which lasts from 3 to 12 minutes. The composition with which they are filled consists of saltpetre, sulphur, meal gunpowder, pitch, rosin, tallow, and Venice turpentine, about half being saltpetre. The composition is packed in tightly through one of the holes; and the holes are stopped with fuses adjusted to ignite the composition after a certain space of time. Sometimes old pistols barrels, loaded to the

muzzle, are introduced with the composition. Compare CASE-SHOT: SHELLS.

CARCASSONNE, *kâr-kâs-sŭnn':* town in the dept. of Aude, France, on the river Aude, and the *Canal du Midi*, about 55 m. s.e. of Toulouse. It is divided into two parts, the old and new towns. The modern town is well built, with streets at right angles to each other, squares adorned with trees, pleasant boulevards, and several marble fountains. The old town, on a height, is much more picturesque, with its ramparts and towers, parts of them dating from the time of the Visigoths, and the rest, with the castle, from the 11th or 12th c. This old town suffered greatly at the hands of the fierce bigot Simon de Montfort and his Crusaders, who here burned 400 of the Albigenses. In the 14th c. it effectually resisted the Black Prince. The cloth manufactures are important, employing, it is said, upward of 7,000 people. Carcassonne has manufactures also of paper, leather, linen, and soap. The ancient name of the town was Carcaso, and it was a place of some note in the time of Cæsar. Pop. (1901), exclusive of garrison, 30,720.

CARCEL-LAMP, n. *kâr'sĕl-lămp* [from *Carcel*, name of the inventor]: a French lamp in which the oil is raised to the wick by clock-work. It is much used in lighthouses.

CARCERULE, n. *kâr'sėr-ūl* [L. *carcer*, a jail]: in *bot.*, a dry, indehiscent, many-celled fruit, with one or two seeds in each cell, the cells cohering round a common style placed in the axis.

CARCHA'RIAS: see SHARK.

CARCHARODON, n. *kâr-kăr'ō-dŏn* [Gr. *karchar'odōn*, having rough or jagged teeth—from *kar'charos*, sharp-pointed; *odon'tēs*, teeth]: in *geol.*, a genus of sharks of the Tertiary period, whose fossil teeth, etc., are often of great size.

CARCHEMISH, *kâr'ke-mĭsh:* city mentioned thrice in Scripture (2 Chron. xxxv. 20; Is. x. 9; Jer. xlvi. 2); often, but mistakenly, identified with the classical Circesium. It was much further up the Euphrates, nearly on the site of the later Hierapolis or Mabog. As shown by Assyrian inscriptions, it was B.C. 1100–850, a chief city of the Hittites, then masters of Syria from Damascus to the Euphrates at Bier. As commanding the passage of the river, it was of importance in the wars between Assyria and Egypt. Carchemish appears to have been taken by Pharaoh Necho soon after the battle of Megiddo, abt. B.C. 608, and retaken by Nebuchadnezzar, 605. The word means 'fort of Chemosh,' deity of the Moabites.

CARCINOLOGY, n. *kâr'sĭn-ŏl'ō-jĭ* [Gr. *karkin'os*, a crab; *logos*, discourse]: the science that treats of crabs, or the *Crustaceæ;* a treatise on. CAR'CINOL'OGIST, n. *-ō-jĭst*, one skilled in the history, structure, and habits of the *Crustaceæ.*

CARCINOMA, n. *kâr'sĭ-nō'mă* [Gr. *karkin'os*, a crab, cancer]: cancer in general; the ulcerative stage of cancer.

CARD, n. *kârd* [F. *carte*—from L. *charta;* mid. L. *carta*, paper: It. *carta*]: a piece of pasteboard usually written or printed on for social or business purposes; oblong pieces of pasteboard on which figures are printed, used in games. CARD-CUTTER, a machine for reducing cardboard to pieces of uniform and proper size for cards. CARD-TABLE, a table specially adapted for play with cards.

CARD, n. *kârd*, or CARDING MACHINE [F. *carde*, a teasel-frame—from L. *cardŭus*, a thistle, a teasel—from *Carĕrĕ*, to comb wool: It. *cardo*, a thistle: Gael. *card*, to card wool: Ger. *scharren*, to scrape]: an instrument for combing out wool or flax. CARD, v. to comb out wool, flax, or hemp; to separate the finer from the coarser fibres. CARD'ING, imp. CARD'ED, pp. CARD'ER, n. one who. The process of disentangling and arranging in parallel rows the fibres of cotton may be compared to the combing and brushing of one's hair, and the *card* combines the properties of the comb and brush, being a brush with wire teeth instead of bristles. These teeth are inserted in strips of leather fixed upon the surface of a cylinder. Several such cylinders are arranged so that the ends of the teeth are nearly in contact; and the cotton being brought to them, is caught up, passed from one to the other, and as the cylinders revolve is combed out in the form of beautiful films or fleeces, which are removed by a smaller drum-card, called the 'doffer,' and again from this by the 'doffing-knife.' These films, which are of the width of the drum, are next contracted to a narrow ribbon, by being passed through a funnel; and thus narrowed, are called the 'card ends' or 'slivers,' and are now ready for the next process of 'drawing' or 'doubling': see SPINNING.

CAR'DAMINE: see CRESS, BITTER.

CARDAMOM, n. *kâr'dă-mŏm* [F. *cardamome:* L. *cardamōmum*]: Indian spice plant of various species, whose seeds or capsules are used in medicine; of the nat. ord. *Scitamineæ* (q.v.), and belonging to at least two genera, *Amomum* and *Elettaria*. Cardamoms are three-celled, and contain numerous wrinkled seeds, which form an aromatic pungent spice, weaker than pepper, with a peculiar but agreeable taste. On account of their cordial and stimulant properties, they are used in medicine, very generally to qualify other medicines; they are used also in confectionery; in Asia they are a favorite condiment; and in the n. of Germany, they are used in almost every household to flavor pastry.—The cardamoms called *True* or *Officinal Cardamoms*, also known in commerce as *Malabar Cardamoms*, are the produce of *Elettaria Cardamomum*, native of the mountains of Malabar and Canara. They depend for their qualities on a peculiar pungent essential oil, called *Oil of Cardamom*, which may be obtained from them by distilling them with water, and, when fresh, is colorless. This oil acts like other volatile oils in stimulating peristalsis, thus expelling excess of intestinal gases, and they also increase the gastric and intestinal secretions. Other kinds of Cardamom occur in com-

merce, but not equal to the true cardamom in commercial value. The different kinds of cardamom differ not only in strength, but in the character of their aroma. The plants producing them have much general similarity.

CARDAN, *kâr'dan*, JEROME: mathematician, naturalist, physician and philosopher: 1501, Sep. 24—1576, Sep. 2; b. Pavia, Italy; illegitimate son of a physician and jurisconsult at Milan. He received his early education at home, and completed his studies in Pavia and Padua. After some years, he became prof. of mathematics at Milan. Here his reputation began to grow. After a few years, he began to lecture on medicine, to the practice of which he ultimately betook himself. By 1546, his reputation had so increased that he was invited by the king of Denmark to accept a professorship at Copenhagen, which, however, he declined; and in 1552, he went to Scotland, on an invitation from Hamilton, primate of that country. He managed to cure the primate of an inveterate asthma, which had defied the skill of the most celebrated physicians, and returned to Milan enriched by the bounty of his patient. Here he again settled for some time. In the autumn of 1559, however, he removed to Pavia as prof. of medicine, whence, again, in the same capacity, he removed to Bologna, where he continued teaching till 1570, when he was imprisoned for debt. Having regained his liberty in 1571, he went to Rome to avoid his creditors. Here he was speedily admitted a member of the medical college, and pensioned by Pope Gregory XII. The rest of his life he spent, without public employment, in Rome, where he died, a few weeks after finishing his autobiography. Some writers assert, but on no sufficient authority, that he starved himself to death, to fulfill a prediction which he had made as to the time when he should die. It is certain however, that he was a devoted astrologer, and cast horoscopes for himself and others. The fancifulness necessary to support the faith of an astrologer imbued all his voluminous scientific writings. A summary of his notions on physics and metaphysics is given in his two works—*De Subtilitate*, in 21 books, and *De Rerum Varietate*, in 17 books. On the whole, he wrote 122 treatises on physics, mathematics, astronomy, astrology, rhetoric, history, ethics, dialectics, natural history, music, and medicine. These abound in incoherent paradoxes, contradictions and capricious abstractions, more than enough to overwhelm the few profound ideas which he originated. A formula for the solution of certain kinds of cubic equations is called 'Cardan's formula,' and was published by him, as his own invention, in the *Ars Magna sive de Regulis Algebraicis* (1545); but it appears that the formula was really the invention of one Tartalea or Tartaglia. In religion Cardan was heterodox, and commonly reputed an atheist. His numerous writings were collected and edited by Charles Sphon (10 vols., Lyon, 1663).

CARD'BOARD, or CARD: fabric of several layers of paper pasted together. *Bristol-board*, used by artists, is

made entirely of white paper; ordinary cardboard., of fine white paper outside, with one or more sheets of coarse cartridge-paper between. According to the number of layers, they are caled *three*, *four*, *six*, or *eight sheet* boards. *Mill-board*, used by book-binders as the basis of book-covers, is made of coarse brown paper, glued and pressed.

The workman arranges the paper in the order required for pasting; and the pile, called a *head* is placed at his left hand, and the paste-tub on his right He lifts a sheet from the head with his left hand, brushes it over with paste with his right; then another is laid upon that and pasted, until he comes to the last required to complete the thickness of one board, when he removes two sheets, and pastes only the upper one, which thus forms the lower sheet of another board. This is repeated till the whole head is pasted, when it is removed to a press, and the water of the paste squeezed out at the edges. The boards are then separated, and dried by hanging them in a room artificially heated. The cardboard which is now rough and warped, is smoothed and flattened by making a pile consisting alternately of sheets of rough cardboard and copper plates. with a copper plate at top and bottom. This pile is passed between iron rollers, and the smooth surface of the copper impressed upon the cardboard, flattened and polished.

The enamelling of address-cards is produced by brushing over the cardboard, a mixture of *China* or *Kremnitz white* (a fine variety of white lead) and size. After drying, this surface is rubbed lightly over with a piece of flannel, previously dipped in finely-powdered talc; it is then polished by rubbing vigorously with a hard, close-set brush.

CARDENAS, *kâr'dā-nâs:* city of Cuba, cap. of the dist. of Cardenas; on a bay of the n. coast, 105 m. e. of Havana. It was founded 1828, and plundered by Gen. Lopez 1850. It has a railroad to Matanzas and Montalvo, and a shallow but commodious port, with good anchorage and a number of long wharves, frequented by several lines of steamers. Cardenas is surrounded by rich sugar plantations, and exports large quantities of sugar, besides molasses and some coffee. It is well laid out, with broad streets lighted by gas, and good buildings. It is called 'the American city,' many of its merchants being from the United States. In its harbor, 1898, May 11, the U. S. gunboat *Wilmington*, revenue cutter *Hudson*, and torpedo-boat *Winslow* engaged Spanish gunboats and shore batteries. The *Winslow* was disabled and Ensign Bagley, with four of her crew, killed. See Spanish American War; United States. Pop. (two-thirds being white), abt. 11,000.

CARDIA, *kâr'dĭ-a:* the upper orifice of the stomach, called, on account of its vicinity to the heart, by the same Greek name, *cardia*, and probably hardly distinguished from it in the earliest times of Greek medicine.

CARDIAC, a. *kâr'dĭ-ăk*, or Cardi'acal, a. *-dī'ă-kăl* [Gr. *kardĭă*, the heart or the upper orifice of the stomach]: pertaining to the heart; invigorating the heart by stimulants.

CAR'DIAC, n. a medicine that excites action in the heart and animates the spirits; cordials, so called from their action on the heart through the stomach. CAR'DIAL'GIA, n. *-dĭ-ăl'jĭ-ă* [Gr. *algos*, pain]: pain in the stomach; heartburn (see INDIGESTION). CARDITIS, n. *kăr-dī'tĭs*, inflammation of the heart. CARDIOMETRY, n. *kâr-dĭ-ŏm'ĕ-trĭ* [Gr. *metron*, a measure]: a measurement of the heart, as by percussion or auscultation.

CAR'DIFF (*Caer-Taff*, Fort of the Taff): parliamentary and municipal borough and seaport, one of the county towns of Glamorgan, s. Wales; on the river Taff, 170 m. w. of London. Cardiff, with Cowbridge, and Llantrissant, returns one member to parliament. Among the public buildings are the infirmary, town-hall, free library and museum, county jail, law-courts, a lunatic asylum, baths, and a theatre. There is a public park. In six years ending 1881, there had been constructed 145 new streets. Very few of the numerous churches belong to the Church of England. In 1883, it was arranged that Cardiff should be the seat of the new South Wales College.

The port of Cardiff is the outlet for the large mineral and manufactured produce of the central portion of the s. Wales mineral-field, in which are the populous districts of Merthyr-Tydvil, Rhymney, Aberdare, and the Rhondda Valley, with which this port is connected by the Taff Vale, the Rhymney, and the Ely Valley railways, and the Glamorganshire canal. The town is also one of the chief stations on the Great Western line from London to Milford-Haven. The Bute docks, e. and w., area 76 acres, constructed at the expense of the Bute estate, have cost upward of a million sterling, and belong entirely to the present marquis. There are about 40 staiths on the quays of the docks, with machinery of a peculiar construction for the purpose of loading vessels with coal, by which the breaking of the coal is almost entirely prevented. Each of these staiths is capable of shipping 560 tons of coal in a day of 12 hours. There is also a tidal harbor, with 7 staiths, each capable of shipping 400 tons of coal per day, and a low-water pier 1,400 ft. in length. Height of water at spring-tide, 31 ft. 8½ inches; at neap-tide, 21 ft. 7½ inches. Width of sea-gates, 55 ft.; length of quays, 11,100 ft.; width of dock, 300 ft. southern and 500 ft. northern part; depth, 25 ft. Cardiff imports include copper ore, live cattle, salted provisions, foreign fruit and vegetables, corn and flour, etc. The Penarth docks, about 3 m. westward, form another outlet for the trade of the district. Steamers ply between the port of Cardiff and New York, London, Liverpool, Glasgow, Bristol, Cork, Whitehaven, etc.

The assizes (half-yearly, alternately with Swansea) and the quarter-sessions are held at the town hall. The ancient city of Llandaff, now a mere village, is almost connected with Cardiff. Cardiff castle, built in the 11th c., is partly in ruins, and partly occupied by the Marquis of Bute, to whom nearly the whole of the modern town belongs. Robert Duke of Normandy, brother of Henry I.,

died in the castle, after being a prisoner 28 years. Cromwell (1648) after bombarding the castle three days got possession of it through the treachery of one of its defenders, whom he afterward hanged as an example to his own soldiery. This town was anciently important, successively under the British, Romans, and Normans. Pop. (1901) 164,420.

CARDIFF GIANT, *kâr'dĭf:* name given to a rude statue 10½ ft. high, dug up 1869, Oct. 16, at Cardiff, a small village of Lafayette township, Onondaga co., N. Y., and exhibited for months as a petrifaction. The persons who thus deluded the public at last confessed that the 'Giant' had been cut from a block of gypsum quarried at Fort Dodge, Io., sculptured at Chicago, conveyed to Cardiff, and there buried and 'accidentally discovered.'

CARDIGAN, *kâr'dē-gan* (anciently *Aberteifi*, Mouth of the Teify): county town of Cardiganshire, s. Wales, municipal borough ands eaport, in the s.w. corner of the county, on the right bank of the Teify, 3 m. from its mouth, 239 m. n. by w. of London. The streets, except the chief one, are narrow and steep, the houses built of slate-rock. Cardigan became an important town about the time of the Norman conquest. The Normans were frequently defeated before mastering it. There are the remains of a castle on a low cliff on the Teify, supposed to have been founded, 1160, by a Norman baron. The town suffered much in the struggles between the Welsh and the Normans. Pop. 3,511.

CAR'DIGAN, James Thomas Brudenell, Earl of, English general: b. Hambleton, 1797, Oct. 16; d. 1868, May 28. He was educated at Christ Church, Oxford, and was gazetted 1824, May 6. as cornet in the 8th Royal Irish Hussars, under the courtesy title of Lord Brudenell. His family influence and wealth in England procured for him a rapid promotion, and in a few years he had attained the rank of major. Lord Brudenell was next 1830, Dec. 3, made lieutenant-colonel of the 15th Hussars. He was a member of the House of Commons from 1818, until 1837, Aug. 14, when on the death of his father, he became Earl of Cardigan. After his regiment returned from India Lord Cardigan got himself into difficulties with the officers, who, one by one, had to sell out until the feeling of the regiment broke into mutiny in what was known as the 'black bottle quarrel.' This quarrel arose in 1840, while Lord Cardigan's regiment was stationed at Canterbury. One of his officers, Capt. Reynolds, having caused wine to be placed on the table in a 'black bottle,' Lord Cardigan accused him of degrading the mess to the level of a pot-house. This led to angry words: Capt. Reynolds was placed under arrest, demanded a court-martial, but this privilege was withheld from him, and, as the public thought, unjustly. The excitement created by this affair and by his subsequent misunderstanding with another officer also of the name of Reynolds, had

hardly subsided, when he fought a duel with Capt. Harvey Tuckett because this officer had censured his conduct in the *Morning Chronicle*. Capt. Tuckett was wounded, and Lord Cardigan tried before the House of Lords, but, although acquitted, public opinion was against him. His reputation, however, as an accomplished cavalry officer, and the satisfaction which the Duke of Wellington expressed in 1848, with the efficiency of the 11th Hussars, Regiment, which was under Lord Cardigan's charge, led to his promotion. On the outbreak of the Crimean war Lord Cardigan was raised to the rank of major-general, and appointed brigadier in command of the light cavalry brigade. This brigade constituted the celebrated 'Six Hundred,' whose charge at Balaklava will long be remembered as one of the bravest yet wildest feats, perhaps, ever told of in the history of war. As the hero of this daring exploit, Lord Cardigan was received with great enthusiasm on his return to England, and appointed inspector-general of the cavalry.

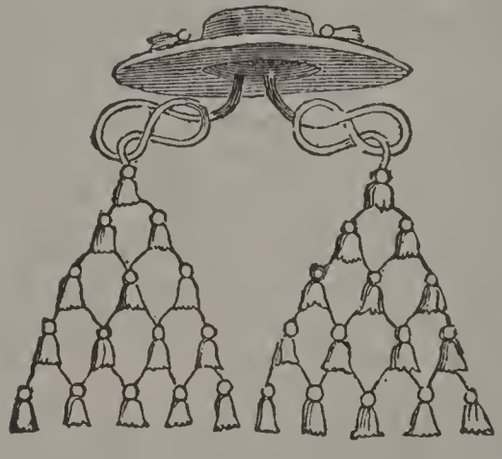
CARDIGAN BAY: semicircular bend of St. George's Channel, on the w. coast of Wales, 45 m. wide from n. to s., and extending 20 m. into the line of land; with a coast of 110 m. Its exterior points are Brach-y-Pwll, off which lies Bardsey Isle, in Caernarvon, and Sturm Head, in Pembroke. It receives the rivers Mawddach, Dovy, Ystwith, Yren, and Teify.

CARDIGANSHIRE, *kâr'dē'gan-shir:* maritime county in s. Wales, on Cardigan Bay; area 675 sq. m., a half being waste. The surface is hilly, interspersed with fertile valleys. A rugged, bleak range of hills runs through the middle of the county, from the s.w. to the n. e., between the coast and the Teify, ending abruptly in a shelving beach in the middle of the coast, but on other parts there are rich flat tracts. The county contains little wood. The chief rivers are the Teify, which rises in a small lake near the centre of the county, and runs 70 m. s.e. and e. along the s. border of the county, the Claerwen, Ystwith, and Rheidol. C. contains some romantic waterfalls, especially the Rheidol Falls and the Devil's Bridge, and above 20 small lakes or llyns, noted for wild beauty. The climate is cold and wet, but mild though wet on the coast. C. is an agricultural county, and its chief branch of industry is the rearing of live-stock. The chief crops are oats, barley, and potatoes on the poor clay and peat soils of the mountains, and wheat, barley, and potatoes on the flat loams of the coast and valleys. There are some manufactures of coarse woolens and gloves, stockings and hats. Oats, barley, cattle, sheep, pigs, butter, slates, and woolens are exported. In 834, the king of C. became king of all Wales under the title of Roderick the Great. He divided Wales among his three sons. After this the Danes and Normans overran C. The county has many remains of British and Roman camps and roads, Druidical circles, cairns, and castles. Pop. (1901) 61,076.

CARDINAL, a. *kâr'dĭ-năl* [L. *cardinālis*, pertaining to a hinge, chief, principal—from *cardo*, a hinge: It. *cardinale;* F. *cardinal*, principal]: pertaining to that on which other things hinge or turn: chief; principal; fundamental; denoting the chief or primary numbers, viz., one, two, three, etc., as distinguished from *ordinal* or derived names of numbers, viz., first, second, third, etc.: N. a dignitary of the Rom. Cath. Chh. next in rank to the pope; an American singing-bird of a red color. CARDINALATE, n. *kâr'dĭ-năl-āt*, or CAR'DINALSHIP, n. the office or rank of a cardinal. CARDINAL POINTS OF THE COMPASS, the four principal points — north, south, east, and west: see COMPASS, MARINER'S.

CARDINAL, *kâr'di-nal:* dignitary in the Roman Church next after the pope, whose electors and councilors they are. The title, however, had at first a more general application. The pope being the sovereign bishop over the whole Roman Church, and having as such many duties to fulfil inconsistent with those of a particular diocese, had, from very early times, a number of bishops, priests, and deacons whom he appointed his vicars and coadjutors for the management of the diocese of Rome. The bishops exercised the episcopal function in the pope's stead, each having a peculiar church within the diocese. The priests were titular parsons of the churches in the city of Rome, and had the cure of souls. The deacons had charge of some churches and chapels of devotion, which they held as deaconries, with the additional duty of assisting the pope when he officiated in public. These three classes of ecclesiastics were called *cardinati* or *cardinales*, to denote that they were the first or chief over the rest, and that all the affairs of the diocese of Rome were under their direction. At a subsequent period, the priests and deacons of other cities of importance assumed the title of C., to distinguish them from other priests and deacons over whom they claimed supremacy; but the popes subsequently ordained that none but those whom they had chosen should be honored with that title. Among those whom the popes thus appointed were the seven bishops *suburbicarii*, who took their titles from places in the neighborhood of Rome. These bishops were called *hebdomadarii*, because they attended the pope for a week each in his turn. These cardinals took part with the Roman clergy in the election of the pope, who was generally chosen from their number. About the beginning of the 12th c., the popes having formed a regular court, began to bestow the rank of C. priest or C. deacon on any individual of the clergy, or even of the laity, whom they chose to select; and to each, whether Roman or foreign, they gave the title of some particular church in Rome, but without attaching to it any obligatory service. Thus the cardinals became a separate body elected for life, and the officiating priests of the Roman parishes were gradually deprived of the title. In 1159, Nicholas II. limited the right of election to the popedom to the cardinals thus appointed, leaving to the rest of the clergy and people of Rome merely the right

of approving of the election of a new pope, and to the emperor that of confirming it. Even these prerogatives, in course of time, were withdrawn. Notwithstanding the great powers thus intrusted to the cardinals, the bishops in the great councils of the church continued to take precedence of them; and it was not till 1614 that Louis XIII. of France, in the sitting of the parliament of Paris, adjudged precedence to the cardinals over the ecclesiastical peers—bishops and abbots. The power of the popes to appoint cardinals has often been contested, and their right to precedence denied, by the other dignified ecclesiastics. In 1567, Pope Pius V. forbade any clergyman not appointed by the pope to assume the title of C.; and Sixtus V., in December 1586, fixed their number at 70—viz., the 6 bishops suburbicarii, 50 priests, and 14 deacons, and on this footing they have since remained, though the number is seldom complete, the pope generally leaving some vacancies for extraordinary cases. The number has frequently fallen greatly under 70. When Nicholas III. was chosen pope, there were but eight cardinals; and a little before the death of Alexander IV., there were but four. Sometimes before Sixtus V. the number was exceeded, as in the pontificate of Pius IV., when there were 74. The body of cardinals is styled the Sacred



Cardinal's Hat.

College. Most of the cardinals reside in Rome, and either enjoy ecclesiastical benefices, or are employed in the administration. When not so provided for, the cardinals receive an allowance of $100 monthly from the papal treasury. Some cardinals belong to monastic orders, and reside in their convents even after their election. The jurisdiction of the C. bishops in the place in which they are established is truly episcopal, but they are not obliged to reside. That of the C. priests and deacons is almost episcopal, but extends no further than the church and sacristy. They have there an episcopal seat under a canopy, like bishops, and they there solemnly give the people their blessing. The creation of cardinals is wholly in the pope. If the new created C. is at Rome, he goes the same day to visit the pope, who puts the red cap on his head. The red hat, which Innocent IV. ordained that cardinals should wear, to

show that they ought to expose themselves to the shedding of their blood in the cause of the church, is afterward given in a public consistory. A number of symbolical ceremonies accompany this investiture. Cardinals that are absent, when chosen, have the cap sent them by a special messenger from the pope. The hat is given by the pope's own hands; and many cardinals who do not visit Rome, die without ever having received it. The only exception is in favor of members of royal houses, to whom the hat is sent. Pope Urban VIII., in 1630, gave to the cardinals the title of Eminence, which they shared with the grand-master of the order of Malta, and the ecclesiastical electors of the German or Roman empire. The pope often employs cardinals as ambassadors, and the individual thus employed is styled legate *a latere*. A C. legate acts, or recently acted, as gov. of the n. provinces of the Papal States, which thence received the name of Legations. The chief secretary of state, the *camerlengo* or minister of finances, the vicar of Rome, and other leading officials, are always chosen from among the cardinals. The council of cardinals, when assembled under the presidency of the pope to discuss matters of church and state, is called the consistorium. There are public consistories, held on great occasions, which correspond to the levees of other sovereigns; and private and secret consistories, which are the privy council of the pope. Moreri's *Dictionary*, *voce Cardinal*, contains a list of cardinals 1119–1724, with their names, countries, etc., and dates of election and death.

CARDINAL BIRD, or Red Bird (*Guarica cardinalis*), called also Cardinal Finch, Cardinal Grosbeak, and Virginian Nightingale: one of the finest song-birds of America.

Cardinal Finch (*Guarica cardinalis*).

It belongs to the family *Fringillidæ*, and differs from the true grosbeaks (*Coccothraustes*) in having the beak slightly bulging. The general color of the male is red, the head being vermilion, and only a small portion of the plumage around the base of the bill being black. The feathers of

the crown are long, and erected into a conical crest, like a red cap. The C. B. abounds in Texas, Florida, and the s. states of America generally, migrating northward in spring, but never farther than Massachusetts, where only a few stragglers are seen. Its loud, clear, sweet, and varied song is heard chiefly in the mornings and evenings. In size it exceeds any of the British *Fringillidæ*, being about equal to the starling.

CARDINAL FLOWER: see LOBELIA.

CARDINAL POINT AND VALUE, that point in a series of increasing intensities of sensation in which the external stimulus has its maximum relative effect; that is, where it is strong enough to fully overcome the natural inertia of the sense organ on the one hand, and is not intense enough to exhaust the organ on the other hand. Cardinal value is sometimes used in connection with feelings to designate that point in a series of sensation intensities at which a given sensation quality arouses a maximum pleasurable feeling.

CARDINAL POINTS: see COMPASS, MARINER'S.

CARDINAL VIRTUES: a term applied to those virtues which are regarded as being primary and upon which all other virtues are thought of as being dependent. In the Platonic Philosophy these virtues are prudence, temperance, fortitude, and justice. Temperance in this sense applies to self-control and moderation in all things. Each religion emphasizes some special virtues. In Christianity, for instance, love and self-sacrifice play the most important part.

CARDINAL VON WIDDERN; GEORG, *gā-ōrg kâr'-dē-nâl fŏn vĭd'dĕrn*, German military historian: b. Wollstein, 1841, April 12. He entered the army in 1859; was engaged in the war of 1866 and the Franco-Prussian war; and was professor at the military school at Neisse. He retired in 1890 and has since lived in Berlin. He wrote *Der Rhein und die Rheinfeldzüge* (1869); *Belgien Nordfrankreich, der Niederhein und Holland als Kriegsfeld*; *Die Russischen Kavallerie-divisionen und die Armeeoperationen in Balkanfeldzuge* (1878); *Das 76 Armeekorps und die 7 Kavallerie-division wahrend ihner selbstandigen Operationen in Mosclfeldzug bli Metz* (1886); and a number of works on military tactics.

CARDINALS, COLLEGE OF: an ecclesiastical body consisting of the highest dignitaries in the Rom. Cath. Church. According to the present constitution of the sacred college that body consists of 70 members—though very rarely indeed, if ever, are all the places filled. Of the 70, six are cardinal-bishops, and they are the ordinaries of sees in the neighborhood of Rome; 50 cardinal-priests, and 14 cardinal-deacons. The cradinal-bishops number five, all Italians; the cardinal-priests 52, and of these four are Spaniards, seven Frenchmen, one German, one Belgian, one Pole, one American, three British and Irish, two Austrians, two Hungarians, one Bohemian; the rest Italians.

There are eight cardinal-deacons, among them one German and one Spaniard; the rest Italians. The scarlet hat is distinctive of the cardinalitial dignity, and above the double cross in the arms of an archbishop who is a cardinal is the figure of the scarlet hat with its tasseled pendants.

CARDINIA, *kâr-dĭn′ĭ-a:* genus of fossil conchiferæ, containing 85 species, which extend from the Silurian to the inferior oolite. They have an oval or oblong shell, attenuated posteriorly, and marked with lines of growth, and an external ligament. They occur abundantly in the valuable layers of clay-ironstone called 'mussel-bands.'

CARDIOGRAPH, n. *kâr′dĭ-ō-grăf* [Gr. *kardĭă*, the heart; *grapho*, I write]: an instrument for registering the movements of the heart.

CARDIOID, *kâr′dĭ-oyd*, a heart-shaped curve. It is produced by drawing a great number of chords from a single point of the circumference of a circle, prolonging each beyond the further crossing of the circumference to a distance equal to the diameter of the circle, and joining the free ends by a smooth curve. It is a special case of the limaçon, in which the extension of the chords is of any uniform length.

CARDITIS, *kâr-dī′tĭs*, or Inflammation of the Heart, disease of very rare occurrence, if the term be limited to cases of true acute inflammation of the muscular structure of the heart itself. C., however, was commonly understood in a wider sense, to include certain forms of disease of the external and internal lining membrane of the heart; and it is only since the beginning of the present century that, through improvements in medical pathology and diagnosis, the names of Pericarditis and Endocarditis (q.v.) have become common for indicating the most ordinary inflammatory affections of the heart. See HEART, DISEASES OF THE.

CARDIUM, n. *kâr′dĭ-ŭm* [Gr, *kardĭă*, the heart]: the cockle, so named in allusion to its heart-like form. For Cardium and Cardiaceæ, see COCKLE.

CARDONA, *kâr-dō′nâ:* town of Catalonia, Spain, about 44 m. n.w. of Barcelona. It is on a declivity on the right bank of the Cardener, is surrounded by walls pierced with six gates, and commanded by a castle on a height. It is noted for a mountain of salt in its vicinity, which has a height of about 500 ft. Pop. 3,800.

CARDOON, n. *kâr-dôn′* [F. *chardon*—from It. *cardo*—from L. *cardŭus*, a thistle], (*Cynara Cardunculus*): perennial plant of the same genus with the ARTICHOKE (q.v.), native of the s. of Europe and the n. of Africa. It very much resembles the artichoke, but is larger, while the flowers (heads of flowers) are smaller. It has long been in cultivation, for the sake of the blanched leaf-stalks and midribs of the leaves, used as a salad, or more generally as a boiled vegetable during winter.

CARDS.

CARDS: oblong pieces of pasteboard printed in figures, used for games. All that is certainly known of the origin of C. is that it is ancient and eastern. What is asserted by Count de Gebelin and the earliest writers upon the subject, that in their primary stage they constituted some sort of symbolic and even moral game, is not so well established. The Hindu and Chinese C. are, however, emblematic in very high degree—the former illustrating the ten avatars, or incarnations of the deity Vishnu; and the so-called paper-tickets of the Chinese typifying the stars, the human virtues, and, indeed, almost anything. The learned Sir William Jones expresses himself convinced that the Hindu game of *Chaturaji*—the Four Rajahs or Kings—a species of highly complicated chess, was the first germ of games with C. In the wardrobe accounts of Edward I., there is an item of money paid for the use of that monarch for playing at the Four Kings—'ad opus regis ad ludendum ad *quatuor reges*, viii.*s.* v.*d.*'—which is supposed to have been a game at C.; but how and when painted C. took the place of carved figures, is still matter of conjecture.

A pack of Hindustani C., in the possession of the Royal Asiatic Soc., presented to Captain Cromline Smith 1815 by a high-caste Brahman, was declared by the donor to be actually 1000 years old. 'Nor,' quoth the Brahman, 'can any of us now play at them, for they are not like our modern cards at all.' Neither, indeed, are they much like our own—the pack consisting of no less than eight suits of divers colors, the kings being mounted upon elephants, and the viziers, or second honors, upon horses, tigers, and bulls. Moreover, there are other marks by which the respective value of the common C. may be distinguished, which would puzzle modern players not a little—such as 'a pineapple in a shallow cup,' and 'a something like a parasol without a handle, and with two broken ribs sticking through the top.' In the Chinese dictionary, called *Ching-tsze-tung*, it is asserted that dotted C. were invented in the reign of Seun-ho (A.D. 1120), and devised for the amusement of his numerous wives: there are 30 C. in each of these packs, three suits of nine C. each, and three single C. superior to all the others. The name of one of the suits is *Kew-ko-wan*—that is to say, the nine ten-thousands of kwan, strings of beads, shells, or money; and the titles of the other two suits are equally concise and significant. The Chinese C. have, however, a decided advantage over those of Hindustan in being oblong instead of circular.

C. do not appear to have been known in Europe until toward the end of the 14th c. 'In the year 1379,' writes Carelluyzo, 'was brought into Viterbo the game at cards, which comes from the country of the Saracens, and is with them called *naib*.' 'Whence afterwards,' says Mr. W. Chatto (*Origin and History of Playing Cards*, Lond. 1848), 'perhaps Jackanapes, Jack of cards.' This entry occurs in the accounts of the treasurer of Charles VI. of France, 1393: 'Given to Jacquemin Gringonneur, painter, for three packs of cards, gilt and colored, and

variously ornamented for the amusement of the king, fifty-six sols of Paris.' From the date of this year being immediately subsequent to that in which the king lost his reason, the story goes that C. were invented to divert his royal melancholy; but they were certainly of earlier use in France. The French clergy took greatly to C. about this time, and, it seems, to the ungenteel game of all-fours, since they were specially forbidden that amusement by the synod of Langres, 1404.

Card-making became a regular trade in Germany 14 years after this, and it, as well as card-painting, seems to have been carried on for some time exclusively by women; the wood-engraving of C., however, did not begin until some time afterward. The pips were then very prettily imagined, the suits consisting of hearts, bells, acorns, and leaves. The place of her majesty the queen was filled by a knight in those days; and it is to Italy, and not to Germany or France, that the glory of giving *place aux dames* must be conceded. There was also no ace whatever! By 1420, gambling by means of C. had grown to such a pitch as to provoke St. Bernardo to preach against it at Bologna; and that so eloquently, as to cause his hearers to make a fire in the public place, and throw all the C. in their possession into it—a proceeding which must have been hailed with joy by the Messrs. De la Rue of that period. The signs upon Italian C., which seem to have been the first imported into England, were cups, swords, money, and clubs; but in the third year of Edward IV. their further importation was forbidden, and the home-trade of card-making protected. C. were played by that time, we read, 'in all places of worship' in England, by which was meant, not the churches, but the houses of worshipful or notable people, the gentry. Henry VII. was a card-player; and there are not a few entries in that mean monarch's privy-purse account of his majesty's little losings. His daughter Margaret, at the age of 14, was found by James IV. of Scotland—the first time he ever saw her—in the act of playing cards; and it was most probably *écarté*, for he at once 'proposed' to her, and she 'accepted' him. There was a sum regularly allotted to the Princess, afterward Queen Mary, as pocket-money for this especial purpose; the sums given her at a time for immediate disbursement ranging from 20*s*. to 40*s*., but one entry being so disgracefully low (for a princess) as 'two and tuppence.' James I. likewise played a good deal, but so sleepily, that he required some body to hold his C. for him.

About the year 1660, heraldic C. were introduced into England, the King of Clubs being represented by the arms of the pope; of Spades, by those of the king of France; of Diamonds, by those of the king of Spain; and of Hearts, by those of the king of England. From these heraldic C., we suppose Mr. Chatto derives the word coat-card, instead of court-card, which is certainly in more general use. In 1679 a pack was published containing the history of all the popish plots, 'excellently en

graved on copper-plates, with very large descriptions under each card. Aspersers of this pack,' it is added by their disinterested publisher, 'plainly show themselves to be popishly affected.'

The French, from whom we derive our ordinary suits of diamond, heart, spade, and club—*carreau, cœur, pique,* and *trèfle*—were continually changing their court-cards, and representing on them all sorts of historical characters. In the earlier periods their kings were David, Alexander, Cæsar, and Charlemagne, or Solomon, Augustus, Clovis, and Constantine; about all of whom, as well as their queens, Père Daniel has the most ingenious theories. Troops, says he, however brave and numerous, require to have prudent and experienced generals. The *trèfle* or clover-plant, which abounds in the meadows of France, denotes that a chief ought always to encamp his army in a place where he may obtain forage for his cavalry; *piques* and *carreaux* signify magazines of arms, which ought ever to be well stored—the *carreau* being a sort of heavy arrow shot from a cross-bow, and which was so called from its head being squared (*carré*); *cœurs,* hearts, signified courage of both commanders and soldiers; the *ace* was the Latin *as,* and represented money, the sinews of war: and so on.

At the time of the French Revolution, the places of the card-kings were filled by four philosophers—Molière, Lafontaine, Voltaire, and Rousseau; and those of the queens by four virtues—Prudence, Justice, Temperance, and Fortitude.

Many attempts have been made to put down card-playing by the strong hand of the law; but the history of the four kings has, nevertheless, always retained its students. Not a few enthusiastic players have died with cards in their hands, such as the great Bath player Lookup, who expired at his favorite 'double dumby,' not even being permitted by inexorable death to play out the game.

The manufacture of playing-cards comprises many interesting processes. The cardboard used is of several thicknesses of paper pasted together; there are usually four such thicknesses; and the paper is so selected as to take paste, paint, and polish equally well. The sheets of paper are pasted with a brush, and are united by successive processes of cold-drying, hot-drying, and hydraulic pressure. Each sheet is large enough for 40 cards. The outer surfaces of the outer sheets are prepared with a kind of flinty coating, which gives sharpness to the outline of the various colored devices. Most packs of cards are now made with colored backs. The ground-tint is laid on with a brush, and consists of distemper color, or pigments mixed with warm melted size. The device impressed on this ground-tint is often very beautiful. Messrs. De la Rue, the leading British firm in the manufacture, employ tasteful artists, and invest a large capital, in the introduction of new patterns. On cards sold at moderate prices, the colors at the back are generally two—one for the ground, and one for the device; but some of the choicest specimens display several colors; and many of the designs are due to the pencil of Mr. Owen

Jones. The printing of the design is done on the sheets of paper, before the pasting to form cardboard. The pips or spots on the faces of playing-cards are now *spades, clubs, hearts,* and *diamonds;* but at different times and in different countries there have been leaves, acorns, bells, cups, swords, fruit, heads, parasols, and other objects similarly represented. In English cards, the colors are red and black; Messrs De la Rue once introduced red, black, green, and blue for the four suits; but the novelty was not encouraged by card-players. The same makers have also endeavored to supersede the clumsy devices of kings, queens, and knaves, by something more artistic; but this, too, failed commercially; and the old patterns are still preferred. Until the last few years, the printing of cards was generally done by *stencilling,* the color being applied through perforated devices in a stencil-plate. The color employed for this purpose is mixed with a kind of paste. When there is a device at the back, the outline of the device is printed from an engraved wood-block, and the rest filled in by stencilling. The stencilling of the front and back can be done either before or after the pasting of the sheets into cardboard. One great improvement in the manufacture has been the substitution of oil color for paste or size color; and another, the substitution of printing for stencilling. Messrs. De la Rue have expended large sums of money on these novelties; for many experiments had to be made to determine how best to employ oil color so that the spots or pips may be equal-tinted, the outline clear and sharp, the pigment well adherent to the surface, and the drying such as to admit of polishing without stickiness. The plates for printing are engraved on copper or brass, or are produced by electrotype, or are built up with small pieces of metal or interlaced wire. The printing is done in the usual way of color-printing, with as many plates as there are colors (usually five), and one for the outlines; it is executed on the sheets of paper, before being pasted into cardboard. When the printing, drying, and pasting all are completed, a careful polishing is effected by means of brush-wheels, pasteboard-wheels, heated plates, and heated rollers; in such a way that the polish on the back may differ from that on the face—since it is found that two equally polished surfaces do not slide quite so readily over each other. Every pack of cards made in England for home-use pays a duty of threepence, which duty is levied on the ace of spades. The cardboard, when all the printing is finished, is cut up into cards; every card is minutely examined, and placed among the 'Moguls,' 'Harrys,' or 'Highlanders,' as they are technically called, according to the degree in which they may be faultless or slightly specked; and the cards are finally made up into packs. The Moguls are the best cards.

A few years ago, it was estimated that about half a million packs of cards are made annually in England, by about seven or eight firms. Card-playing is not now so general in England as it was early in the century, and the number made has consequently lessened, though the qual-

ity has greatly improved. All the cards used in Russia, with a few exceptions, are made at an imperial manufactory in St. Petersburg, where the operations are on a large scale, and where the number of packs made exceeds manyfold the whole produce of England. The French cards are somewhat smaller and thinner than those of England. In the United States many varieties of C. are used, some of home manufacture, though there is a large importation also.

CARDUE'LIS: see GOLDFINCH.

CAR'DUUS: see THISTLE.

CARD'WELL, EDWARD, D.D.: 1787–1861, May 23; b. Blackburn, Lancashire, England. He was educated at Brasenose College, Oxford; B.A. 1809, M.A. 1812; became fellow tutor, lecturer, one of the univ. examiners 1814, Camden prof. of ancient history 1826, and principal of St. Alban's Hall, 1831, succeeding Whately. He was also constantly and variously employed in functions of importance in his univ. He published *Lectures on the Coinage of the Greeks and Romans*, 1832; editions of Aristotle's *Ethics*, abt. 1830; of Josephus's *Wars of the Jews*, 1837; of the Greek Testament, 1837; and of Bp. Gibson's *Synodus Anglicana*, 1854. The latter was on the lines of an extensive work which C. projected, to embrace the entire synodical history of the English Church, on the basis of Wilkins's *Concilia*. It began with *Documentary Annals of the Reformed Church of England*, 1546–1716 (2 vols. 1839), and was continued in a *History of Conferences* connected with Prayer-book revision, 1550–1690 (1840); *Synodalia* (2 vols. 1848); and *Reformatio Legum Ecclesiasticarum* (1850). C. died at Oxford.

CARD'WELL, EDWARD, Viscount: 1813, July 24—1886, Feb. 15; nephew of Edward C., D.D.: b Liverpool, where his father was a merchant. He took a double first-class at Oxford 1835, was called to the bar 1838, returned to parliament for Clitheroe 1842, for Liverpool 1847, and sat for Oxford 1853–74. He followed Sir Robert Peel, and afterward joined the liberals: was sec. of the treasury 1845–46; pres. of the board of trade 1852–55; chief sec. for Ireland 1859–61, and thought he had settled the Irish land question by an act empowering limited owners to give leases, 1860; chancellor of the duchy of Lancaster 1861–64; sec. for the colonies 1864–66, and won approval by his course with regard to the Jamaica riots, 1865; member of the council of education and sec. for war 1868. The Army Regulation Bill, which abolished the old system of promotion by purchase, etc., nearly marks the close of his more eminent public services. Gladstone raised C. to the peerage 1874. He died at Torquay.

CARE, n. *kär* [AS. *cearian*, to take heed; *cear*, care: Icel. *kaeri*, complaint. Goth. *kara*, care: Gael. *carc*, care: L. *carus*, dear]: thoughtful attention: uneasiness of mind; concern; regard; charge; the object of care or love: V. to be anxious or uneasy in mind; to heed or regard. CA'RING imp. CARED, pp. *kärd*. CAREFUL, a. *kär'fúl*, full of

ncern; attentive to; watchful; cautious. CARE'FULLY, ad. *-lĭ*. CARE'FULNESS, n. the state or quality of being careful; anxiety; caution. CARE'LESS, a. without concern or thought; regardless; inattentive; unconcerned. CARE'LESSLY, ad. *-lĭ*. CARE'LESSNESS, n. the state or quality of being heedless or inattentive; negligence. CARE'WORN, a. crushed with care; fatigued with anxiety. TO TAKE CARE, also HAVE A CARE, be careful; take heed.—SYN. of 'care, n.': solicitude; anxiety; concern; regard; charge; management; caution; direction; oversight;—of 'careful': anxious; solicitous; cautious; provident; wary; circumspect; prudent; discreet; disturbed; troubled; thoughtful; heedful; watchful; vigilant;—of 'careless': inattentive; listless; thoughtless; heedless; negligent; remiss; supine; unthinking; incautious; regardless; forgetful; inconsiderate.

CAREEN, v. *kă-rēn'* [F. *carèner*, to refit—from *carène*, a keel—from OF. *carîne*—from L. *carīna*, the keel of a ship: It. *carena*, bottom of a ship: Dut. *krengen*, to sail on one side]: to lay a ship on one side in order to expose the other side for cleaning or repairs by the process of *breaming* (q.v.). The operation is not as frequent as before the general use of copper sheathing for the bottoms of vessels, and the employment of caissons and hydraulic elevators to raise ships out of the water; to incline much to one side while sailing, as a ship. CAREEN'ING, imp.: N. the act of heaving down a ship on one side. CAREENED', pp. *-rēnd'*. CAREENAGE, n. *kă-rēn'āj*, place for careening a ship; expense of careening.

CAREER, n. *kă-rēr'* [F. *carrière;* It. *carriera*, a race, a highway, a career—from L. *carrus*, a two-wheeled cart; *currus*, a chariot, a car (see CAR)]: the ground on which a race is run; course of action; course in life; procedure; a race or running; speed in motion: V. to run or move rapidly. CAREER'ING, imp. CAREERED', pp. *-rērd'*.

CAREFUL, CARELESS, etc.: see under CARE.

CARESS, v. *kă-rĕs'* [F. *caresse*—from It. *carezza*, an endearment: W. *caru*, to love: Gael. *cairich*, to soothe]: to treat with fond affection; to embrace with affection and love, as a parent a child; to fondle: N. an act of endearment; an expression of affection. CARES'SING, imp. CARESSED', pp. *-rĕst'*. CARES'SINGLY, ad. *-lĭ*.

CARE, or CARLE, SUNDAY: the Sunday before Palm Sunday, said to be so called from the practice in many parts of the country of eating gray peas, called carlings, fried in butter, pepper, and salt, on this day. This practice apparently had its immediate origin in the custom in the Rom. Cath. Church of eating hallowed beans fried at this time—these beans being described in some religious books as symbolical of confession, and their steeping before use, of meditation. The custom seems however to have had an earlier heathen origin. See Brand's *Popular Antiquities*.

CARET, n. *kā'rĕt* [L. *caret*, it wants or is wanting]: a mark thus (∧), put between two contiguous words, to show

in written compositions that something is omitted in a line, and that the omitted words are interlined.

CAREW', Sir GEORGE: d. abt. 1613; second son of Sir Thomas W. Carew, of Antony. He was educated at Oxford, travelled for several years, was knighted by Queen Elizabeth, and was ambassador to the king of Poland. Under James I. he negotiated the treaty of Union with Scotland, and was sent on an embassy to France. Returning 1609, he addressed to the king, *A Relation of the State of France*, with characters of Henry IV. and others of note. This Dr. Birch published in his *Historical View*, 1749, as 'a model on which ambassadors may form and digest their notions and representations' The poet Gray called it an excellent performance.

CAREW, *ka-rō'*, GEORGE, Earl of Totness, and Baron Carew of Clopton in Warwickshire: 1557–1629. He held command in the Irish wars against the Earl of Desmond and the rebels, and was successively gov. of Askeaton castle, lieut. gen. of artillery, lord pres. of Munster 1596, treasurer to the army, and one of the lords judges of Ireland. The whole island was in revolt when his labors began, and was reduced by his vigor and prudence. His chief exploit was the taking of Dunboy castle, which disappointed the Spanish allies and ended the war, 1601. He was made a peer, gov. of Guernsey, and later privy councilor to James I. His deeds are recited in *Pacata Hibernia*, a work published by his son 1633. Bp. Nicolson says he wrote 42 MS. vols. relating to Irish affairs, preserved in the library at Lambeth, and 4 more in the Cottonian library. He also translated two historical works from the French. The Camden Soc. printed some of his letters 1860. He died at London.

CAREW, *ka-rō'*, THOMAS: 1589–1639; of an old family in Gloucestershire: poet of the reign of Charles I. Having been educated at Oxford, he travelled abroad, and on his return was received at court, and patronized by Charles I. He is notable chiefly as the precursor and representative of what may be called the courtier and conventional school of poetry, whose chief characteristic was scholarly ease and elegance, with a spice of indelicacy, and even indecency. C.'s poems, mostly lyrical, and treating of trifling subjects, are among the best of their kind, and exhibit much fancy and tenderness. The best edition of his poems (pub. first 1640) is by W. C. Hazlitt (1870).

CAREX, *kā'rĕks* or *kär'ĕks:* genus of plants of the nat. ord. *Cyperaceæ*, of which the species are very numerous—more than 450—principally in the temperate and colder parts of the world. The English name SEDGE or SEG is sometimes employed as synonymous with C., but is popularly applied only to some of the species. This genus is distinguished by unisexual flowers, the male flowers with one glume, the female inclosed in a flask-shaped involucre. Some of the species are plants of the very humblest growth, others are two or three feet in height; all are of unpretending, grassy, or rush-like appearance. Some grow in

wet and others in dry situations; some are of great value in the economy of nature, as forming the principal part of the vegetation of swamps, which they gradually convert into fertile ground. The running roots, or rather *rhizomes*, of some help to bind the sands of sea-shores, particularly *C. arenaria*, which is carefully planted for this purpose on the dikes of Holland None are valued by the agriculturist, as they are very deficient in nutritive quality, and in general they abound only in very inferior pastures, and good tillage and drainage lead to their speedy disappearance. The rhizomes of *C. arenaria*, *C. hirta*, and *C. disticha*, are sometimes used under the name of *German Sarsaparilla*, as a diaphoretic and demulcent medicine—a poor substitute for sarsaparilla.

CAREY, *kā'rĭ*, HENRY C.: political economist: 1793, Dec. 15—1879, Oct. 13; b. Philadelphia; son of Mathew Carey. He early became a partner in his father's bookselling business; and when in 1835 he retired to devote himself to his favorite study, he was at the head of the largest publishing concern in the United States. Carey's *Principles of Political Economy* (expanded 1837) had a marked influence on economic speculation. In 1838, Carey published *The Credit System of France, Great Britain, and the United States;* and in 1848, *The Past, the Present, and the Future*, a work of vigor and originality. In 1853 appeared *Letters on the International Copyright;* 1858, *Principles of Social Science;* 1867, *Review of the Decade* 1857–67; 1873, *The Unity of Law.* Carey was originally a free-trader, but was ere long recognized as the head of a new school of political economy. According to this system, though free trade may be the ideal toward which progress should tend, a period of protection is an indispensable stage in the progress.

CAREY, JAMES F., American socialist leader: b. Haverhill, Mass., 1867, Aug. 19. He received a common-school education and learned the shoemaking trade. In 1895 he was chairman of a convention at Boston, which amalgamated three national organizations of shoemakers into one union. In 1894 he was one of the leaders in the agitation of the unemployed on Boston Common, and the governor appointed him a commissioner of the unemployed, but he was not confirmed. He was later elected president of the Haverhill common council. In 1898, 1899, 1900, 1901 and 1902 he was elected to the Massachusetts House of Representatives, twice defeating a combination of the Democratic and Republican parties. He was the first Socialist ever elected to political office in New England. He is now national organizer of the Socialist party.

CAREY, *kā'rĭ*, MATHEW: 1760, Jan. 28—1839, Sep. 16; b. Dublin: writer and publisher. He was apprenticed to a printer 1775, published an Essay on Dueling 1777, and a Letter to the Rom. Catholics of Ireland, 1779: the latter gave rise to much excitement, and he fled to Paris,

where he met Franklin and Lafayette. Returning 1780, he conducted the *Freeman's Journal* for a time, and started the *Volunteers' Journal* 1783, Oct. 13. This won rapid success as an opposition sheet, but Carey was arraigned as a libeller before the commons, and committed to Newgate for an attack on parliament and the ministry. Released 1784, May 14, he sailed for America in Sep., and landed at Philadelphia Nov. 15. With $400 sent him by Lafayette, he started the *Penn. Herald* 1785, Jan. 25. This was the first American paper to give reliable reports of debates in congress, which Carey reported in person. In a duel with Col. Oswald, a rival editor, he received a wound from which he did not recover for 16 months. He edited the *American Museum*, a monthly, through 13 vols., 1787–93. His bookselling business was begun in a small way, 1791, and grew till Carey was the most prominent publisher in America, and a very influential citizen. His first original vol. was a *History of the Yellow Fever of* 1793. He helped Bishop White to form the first American Sunday-School Soc., 1796. His *Miscellaneous Trifles* appeared 1798, his American *Pocket Atlas* 1801. A controversy with Cobbett culminated in *The Porcupiniad, a Hudibrastic Poem*, 1799. His *Letters and Reflections on the U. S. Bank* appeared 1810–11. His *Olive Branch, or Faults on both Sides, Federal and Democratic*, 1814, an attempt to harmonize the two parties, went through ten editions. *Vindiciæ Hibernicæ*, 1819, defended his countrymen from the charge of butchering Protestants 1640–41. His *New Olive Branch* (1820) was followed by *Essays on Pol. Econ.* (1822), which advocated protection to domestic products as essential to the welfare of America. Of this doctrine he now became the apostle, urging it in more than 50 tracts, numbering over 2,000 pages. He pub. *Miscellaneous Essays* 1830, and contributed his autobiography to the *New England Magazine* 1833–34.

CAREY, Rosa Nouchette, English novelist: b. London. She began writing novels in 1868, and her fictions, in which the literary element is not a very strong feature, have been very popular with the average, uncritical reader who demands only to be entertained and cares little or nothing for literary style. They include *Wee Wifie* (1869); *Nellie's Memories* (1868); *Barbara Heathcote's Trial* (1871); *Robert Ord's Atonement* (1873); *Wooed and Married* (1875); *Heriot's Choice* (1879); *Queenie's Whim* (1881); *Mary St. John* (1882); *Not Like Other Girls* (1884); *For Lilias* (1885); *Uncle Max* (1887); *Only the Governess* (1888); *Basil Lyndhurst* (1889); *Lover or Friend* (1890); *Sir Godfrey's Grand-daughters* (1892); *Men Must Work* (1892); *The Old, Old Story* (1894); *Mrs. Romney* (1894); *The Mistress of Brae Farm* (1896); *Other People's Lives* (1897); *Mollie's Prince* (1898); *Twelve Notable Good Women*; *My Lady Frivol* (1899); *Rue with a Difference*; *Life's Trivial Round* (1900); *Herb of Grace* (1901); *The Highway of Fate* (1902); *A Passage Perilous* (1903); *At the Moorings* (1904); etc.

CAREY, William, d.d.: 1761, Aug.—1834; b. in humble life, Paulersbury, a village in Northamptonshire, England: Bapt. missionary. He served his time as a shoemaker, but began to preach about his 20th year. A pamphlet which he published about this time attracted attention to foreign missions, and ultimately a missionary society, chiefly through Carey's exertions, was formed. Carey and a Mr. Thomas were chosen its first missionaries to India 1793. From that time until his death Carey was indefatigable (under many difficulties, especially in his early years) in his efforts to spread the gospel among the heathen. Under his direction, the Serampore mission, of which he was the principal founder, had up to 1832 issued above 200,000 Bibles, or portions thereof, in about 40 Oriental languages or dialects, besides a great number of tracts and other religious works in various languages. A great proportion of the actual literary labor involved in these undertakings was performed by Carey himself, whose Sanskrit and other grammars were highly spoken of by the late Wilson Boden, prof. of Sanskrit at Oxford. Carey was oriental prof. at Fort-William College, Calcutta, 1801–30. Besides the great direct results of his labors in heathen lands, the influence of his Christian devotedness has been incalculable in awakening missionary zeal in England and America.

CARFAX, n. *kâr′făks* [OF. *carrefourgs*—from L. *quatŭŏr furcas*, four forks—from *quatŭŏr*, four; *furca*, a fork]: in *OE.*, a place where four ways meet.

CARGO, n. *kâr′gō* [Sp. *carga*, the load of a ship: F. *charger*, to load—from It. *carricare;* Sp. *cargar*, to load—from mid. L. *carrĭcāre*, to load]: all the goods, merchandise or other articles of freight conveyed in a trading ship; freight; lading; sometimes also the invoice of the cargo. Deck cargo, the commodities on deck, not usually included in the policy of insurance. Supercar′go, n. [L. *super*, over]: the person who has the charge of the cargo on board a ship.

CARGOOSE, n. *kâr′gôs* [Mahn suggests from Gael. and Ir. *cir*, *cior* (pronounced *kir*, *kior*), a crest, comb]: a fowl belonging to the Colymbus or diver family, the *Podiceps cristatus*. It is about the size of a goose: see Grebe.

CARHEIL, Etienne de: Jesuit missionary to the Indians in Canada: dates of birth and death unknown. He began work among the Hurons and Iroquois 1668, mastered their languages, won their respect, and was still laboring, with more zeal than success, when Charlevoix left Canada, 1721.

CARIA, *kā′rĭ-â:* in anc. geography, the s.w. country of Asia Minor, bounded n. by Lydia, e. by Phrygia, s.e. by Lycia, and w. and s.w. by the Mediterranean. A large portion of what was C. is mountainous. The chief ranges were called the Cadmian and the Latmian. The most important river was the *Mœander*, famous for its windings. C. was, at an early date, governed by petty princes or kings; it afterward became a part of the Persian empire, the former princes continuing to rule as satraps; and it subse-

quently came into the hands of the early Macedonian kings of Egypt; and finally, with the rest of Asia, into those of the Romans. Among the chief towns were Cnidus, Halicarnassus, and Miletus.

CARIACO, *kâ-rē-â′kō:* seaport of Venezuela, at the mouth of a river, and at the head of the gulf of C.; 40 m. e. of Cumana; lat. 10° 30′ n., long. 63° 40′ w. The gulf, long and narrow, with good anchorage, and well-wooded shores, is open only on the w., and that to a portion of the Caribbean Sea, which is breasted by a chain of islands. Pop. 7,000.

CARIACOU, *kăr′ĭ-a-kô,* or CARJACOU, *kâr′ja-kô,* or VIRGIN′IAN DEER (*Cervus Virginianus*): species of deer found in N. America, from Mexico to about n. lat. 43°, and from the Atlantic to the Pacific Ocean. It is the species commonly called Deer in the United States. It is smaller and more elegant than the common stag; of very variable color—light reddish brown in spring, slaty blue in autumn, and dull brown in winter; the belly, throat, chin, and inner parts of the limbs white. The horns of the adult male are of moderate size, bent strongly backward, and then suddenly forward, so as to bring their tips nearly above the nose; they have several snags. The fawn is profusely decked with white spots, arranged in lines, and sometimes running into stripes. The name C. is extended generically to several nearly allied species in Mexico, California, etc.

ÇARIAMA, or SARIAMA, *săr-ĭ-ā′ma,* or CERIEMA, *sĕr-ĭ-ē′ma* (*Microdactylus cristatus*): bird of the order *Grallæ,* allied to the cranes, but showing points of strong resemblance to gallinaceous birds, among which it has therefore been proposed to rank it, next to the guans. It is a native of Guiana, Brazil, and Paraguay, inhabiting open plains and the outskirts of forests, where it feeds chiefly on serpents, lizards, and insects. It is larger than the common heron; the plumage is brown, finely waved with darker brown, whitish on the lower parts. When pursued, the Ç. seeks safety by running, and does not readily attempt to use its wings. Its voice resembles that of a young turkey. It is much esteemed for the table, and it is sometimes reared in a domesticated state.

CARIBBEAN SEA, *kăr-ĭb-bē′an:* largest inlet of the w. hemisphere; separated from the Gulf of Mexico by Yucatan, and from the Atlantic Ocean by the great arch of the Antilles, between Cuba and Trinidad inclusive; stretching in n. lat. from about 8° to about 22°, and in w. long. from about 61° to about 89°. The C. S. forms the turning-point in the vast cycle of waters known as the GULF STREAM (q.v.), that wheels round, with the regularity of time itself, from s. Africa to n. Europe. It pours its waters into the Gulf of Mexico on the w., which shoots forth, on the e., the Florida Stream with the computed volume of 3,000 Mississippis. To supply this enormous efflux, the C. S. draws on the Atlantic, laying under contribution nearly all the trade-wind regions of that ocean, so as literally to become the receptacle of the Amazon and the Orinoco. To the British

Isles it is, from these facts, an object of peculiar interest. Rendering still warmer the warm floods which it concentrates, it imparts to the Florida Stream that high temperature which tends, with the aid of the prevalent winds, to mitigate climate from Guernsey to Shetland. In common with the islands of its eastern boundary, the C. S. takes its name from their now extinct aborigines, the Caribs.

CARIBBEE BARK, *kăr-ĭb'bē*, or PITON BARK: bark of *Exostemma Caribæum*, a small tree in the West Indies and Mexico, of the nat. ord. *Cinchonaceæ*. The genus *Exostemma* is very nearly allied to *Cinchona*, from which it differs in having the stamens exserted, whereas in *Cinchona* they are included within the corolla. *E. Caribæum* has ovate lanceolate leaves, and is known in the West Indies as the *Seaside Beech*. C. B. has a very bitter taste, and a very faint smell. It contains none of the characteristic alkaloids of cinchona, yet very much resembles it in some of its properties, and is one of the barks sometimes substituted for the true cinchona barks.

CARIBBEE ISLANDS: see ANTILLES.

CARIBOU: see REINDEER.

CARIBS, *kăr'ĭbz:* original inhabitants of the Caribbean Islands or southern West Indies, found by Columbus on Porto Rico, the Lesser Antilles, and the coast of what is now Venezuela and Guiana. The name meant *brave*, and they were a robust, fierce, and cruel race of cannibals, with canoes that would carry 50 men each, and a habit of attacking the gentler Yucayos of the larger islands. They were supposed to have emigrated from the region of Fla., and in the use of paint and some other customs resembled the N. American Indians. On St. Vincent Island they divided into Red and Black, the latter by intermarriage with negroes. The pure Caribs were transferred by the English about 1796 from Dominica and St. Vincent to the island of Ruatan, and thence went to the mainland of Honduras, where they now form an industrious and prosperous part of the population, chiefly in the district between the Paitook river and the Belize. They still retain their original language, said to be one of the softest and most sonorous of tongues, and to have nearly 30 dialects. These red Caribs long kept their independence, living in villages under the command of an elective chief, and gathering for war at the sound of a conch; many of their peculiar customs survive to this day. To the same race probably, if not certainly, belong the Galibi of French Guiana, who were objects of missionary effort nearly 300 years ago, the Yaoi of Venezuela and Trinidad, and other tribes of S. America.

CAR'ICA: see PAPAW.

CARICATURE, n. *kăr'ĭ-kă-tūr* [It. *caricatura*, an overloaded representation of anything—from *caricare*, to load: comp. Gael. *carach-gu-tur*, altogether twisted]: a twisted or distorted resemblance; a figure or description of a person or thing in which defects are greatly exaggerated in order to make ridiculous: V. to sketch or describe in order to turn

into ridicule; to represent as very ugly. CAR'ICATU'RING, imp. CAR'ICATURED, pp. *-tūrd.* CAR'ICATU'RIST, n. *-tū'rĭst,* one who.—SYN. of 'caricature, n.': burlesque; parody; satire; travesty; sarcasm; comedy; irony.

CARICATURE, *kăr'ĭ-ka-tūr:* representation of a face, form, or character, in which the salient features are exaggerated or overloaded, to the extent of producing a ludicrous effect, without entirely, or even essentially destroying the resemblance. Caricature may be regarded as the opposite of idealization; it consists in a disproportionate development of some, very frequently of one only, of the characteristics of the subject treated, while the latter is a proportunate elevation of them all. Indeed, the destruction of harmony is essential to caricature, and where harmony is the prevailing quality of its subject, the required effect may frequently be produced by this means alone; whereas harmony belongs of necessity to idealization, and where its absence was the characteristic defect of the object as a real existence, an ideal of a humble kind may frequently be produced by simply restoring it.

When used with reference to sensible representation, caricature stands, to the genuine productions of the plastic and pictorial arts, in the same relation in which farce stands to the legitimate drama. Both caricature and farce are thus degenerate forms of art; and though requiring much cleverness for their successful execution, and often affording lively entertainment to the spectator, can scarcely be said in general to have an elevating object, or any other tendency than to divert. When used as ancillary to well-directed and merited satire, caricature assumes a nobler character, and it is frequently thus employed in ephemeral English literature. Good examples of caricature are supplied in the pages of *Punch*; *Puck*; *Judge*; *Life*; etc.

CARIES, n. *kā'rĭ-ēz* [L. *caries*, rottenness; It. and F. *carie*]: the mortification of a bone in the living body; decay or rottenness of a bone, or a tooth. CA'RIOUS, a. *-ŭs,* decayed or rotten. CA'RIOS'ITY, n. *-ŏs'ĭ-tĭ,* rottenness of a bone.

CARIES, *kā'rĭ-ēz:* disease of bone analogous to ulceration of soft tissues. It is characterized by a gradual loss of substance, from the particles of bone being absorbed, or being cast off and washed away in a purulent discharge. It begins as an unhealthy inflammation, followed by exudation of new materials, and softening of the part affected. On examination, the bone-cells are found filled with a reddish glairy fluid, and in scrofulous patients, deposits of tubercle. After C. has existed for some time, an abscess forms, and bursts; its aperture remains open, discharging a thin fluid, which contains particles of the bone. If a probe be passed through this opening, it will be felt to sink into some soft gritty substance: this is the carious bone, which, if removed,

and well washed, will be found to resemble in whiteness and fragility loaf-sugar softening in hot water.

C. may attack any bone, but it usually selects the vertebræ, the bones of the wrist and foot, and the soft ends of the thigh and other long bones forming joints. The carious vertebræ yield under the weight of the trunk, and the spine curves forward. In the joint-ends of bones, the part enlarges, the cartilages become affected, matter forms, and amputation of the limb, or excision of the joint, is frequently necessary to save the patient's life; though too often the disease recurs or death results from disease of the kidney or pulmonary tuberculosis. C. affecting the bones or joints is of tuberculous nature. See TUBERCULOSIS OF THE BONES AND JOINTS.

Caries of the Teeth depends, it is supposed, on an original faulty formation of their substance, which renders the enamel and dentine less resistant to the action of the decalcifying process in which caries essentially consists. The theory of dental caries now generally accepted is that it is produced by the action of acids formed by bacteria (*Leptothrix buccalis*) present in the mouth. Thorough and regular brushing of the teeth, together with the use of an alkaline dentifrice or mouth wash is usually effective in preventing caries; when the process has already begun, the carious surface should be removed, and, as a substitute for the lost dentine, gold or some other durable material should be stuffed into the cavity.

CARINA, n. *kăr-ī′nă* [L. *cărīna*, the bottom of a ship, the keel]: in *bot.*, the two partially-united lower petals of a papilionaceous flower, such as the pea, which have a keel-like shape; one of the shell valves of a cirripede. CARINATE, a. *kăr′ĭ-nāt*, or CAR′INATED, a. *-nā-tĕd*, keel-shaped, as the two lower petals of a papilionaceous flower; having a projecting keel as the breast-bone of most birds. CAR′INAL, a. *-ĭ-năl*, applied to æstivation when the carina embraces the other parts of the flower. CARINATÆ, n. plu. *kăr′ĭ-nā′tē*, those birds whose breastbone is keeled —that is, all except the ostrich and its allies.

CARINARIA, *kăr-ĭ-nā′rĭ-a* or *kăr-ĭn-ār′ĭ-a:* remarkable and interesting genus of gasteropodous mollusks, of the order *Heteropoda* or *Nucleobranchiata*, having a thin shell, in form somewhat like that of a limpet, which, however, covers only the visceral sac (heart, gills, etc.), leaving the greater part of the animal exposed. The shells of some of the species have been sometimes denominated *Venus's Slipper* and *Glass Nautilus*. The body is gelatinous, and so transparent that much of its interior organization can be seen. Nearly opposite the part of the back occupied by the shell is a sort of vertical fin, answering to the foot of the other gasteropods. The species of C. are all marine, are found only in the seas of the warmer latitudes, and generally swim with the back downward. Closely allied to carinaria is the genus *Firola*, in which there is no shell at all.

CARINTHIA, *ka-rĭn′thĕ-a* (Ger. *Karnthen*): a crown-

land of the Austrian empire, forming part of the old kingdom of Illyria; 3,958 sq. m., and a population, in 1900, of 367,324, which is 6,316 more than what it was in 1890. The principal river is the Drave, which passes through the country from w. to e., in a course of 150 m. The general aspect of the country is mountainous, with long deep valleys, that of the Drave widening at Villach and Klagenfurt into a great plain. The valley of the Drave divides the *Noric* from the *Carinthian Alps*. Agriculture is limited by the mountainous character of the country, great part of which is occupied in pasture, or covered with brush-wood. Many horses and cattle are reared and exported. The principal products are mineral. One of the chief branches of industry is the manufacture of hardware; the other manufactures include woolens, silk stuffs, and cottons. The capital is Klagenfurt.—The ancient inhabitants were the *Carni*, who derived their name from the Celtic word *carn* or *corn*, Lat. *cornu*, Eng. *horn*—an allusion to the craggy, horn-like pinnacles of their hills. Before the time of Augustus, it belonged to Noricum, afterward to the Roman empire. By and by the Carni were swept away in the deluge of immigration from the east, and slaves settled in the country. After some time the slaves themselves were so heavily oppressed by the Avari, that they called to their assistance a Frank, named Samo, who founded the kingdom of Carantania, which included much more than the present C., but fell to pieces after his death. Finally it came into the possession of Austria (q.v.). Only about two-sevenths of the present pop. is Slavic (Slovenians), the remainder being Germans.

CARIOLE, or CARRIOLE, n. *kăr'ĭ-ōl* [F. *carriole*—from It. *carriuola*]: a small open carriage; a covered cart.

CARIPE, *kâ-rē'pā:* town of Venezuela, S. America, 50 m. s.e. of Cumana. The valley of C. is noted for a cavern frequented by the remarkable bird called Guacharo (q.v.). Pop. of town and valley, 5,000.

CARISBROOKE: see WIGHT, ISLE OF: NEWPORT.

CARIS'SA: genus of plants of the nat. ord. *Apocynaceæ*. *C. Carandas* is a thorny shrub, much used for fences in India; and the fruit, called carandas—a berry about the size of a small plum—for tarts and preserves.

CARISSIMI, *kâ-rĭs'ē-mē*, GIACOMO: 1604–74; b. Marino, near Rome: musician. He was chapel-master at Assisi, and held the same post at St. Apollinaris in Rome 1628–74. He composed many oratorios, masses, cantatas, and motets, and is noted for effective harmony and for graceful and spirited melodies. C. introduced orchestral accompaniments to sacred music, but his great achievements were the development of the recitative and the invention of cantatas. He is considered the founder of the music of the 17th c.: his style was perfected by his pupils Bononcini, Bassani, and Scarlatti. Most of his compositions are preserved in the library of Christ Church, Oxford, and some in the British Museum.

CARK, n. *kârk* [AS. *cearig*, careful, anxious; Ger. *karg;* Dan. *karrig*, niggardly; Icel. *kargr*, stingy, sluggish; Gael. *curam*, care; W. *carcus*, solicitous]: in *OE.*, great care; fretful anxiety. CARK'ING, a. vainly anxious; causing anxiety: N. anxiety. CARKING CARE, a fretful and anxious solicitude.

CARL, or CARLE, n. *kârl* [AS. *ceorl;* Icel. *karl*, a man]: a bondman; a rude, rough man; a man. CARLINE, n. *kâr'lĭn*, in *OE.*, a stout old woman. CARLOT, n. *kâr'lŏt*, in *OE.*, a rustic; a churl.

CARLEE, *kâr'lē*, or KARLI: village of India, dist. of Poonah, 40 m. e. of Bombay. It is noted for a Buddhist cave-temple, 130 ft. long and 40 ft. wide, in good preservation, cut in the side of a precipitous hill, some 500 ft. above the plain. This has a double row of sculptured pillars, ending in a semicircle, with a high arched and cathedral-like roof. In front are carved lions and elephants, the latter with drivers and howdahs occupied by two persons. On each side of the door is screen-work covered with human figures in alto-relievo. The only apparent object of devotion is the mystical chattah or umbrella. Near are smaller excavations or hermits' cells now in decay.

CARLÉN, *kâr-lān'*, EMILIA SMITH FLYGARE, Swedish novelist: b. Strömstad, 1807, Aug. 8, d. Stockholm, 1892, Feb. 5. In 1838 she published her first novel, *Waldemar Klein*, and among the best of her subsequent works are the *Professor* (1840); *A Year* (1846); *The Brother's Bet*; and *The Guardian* (1851). Several of her novels have been translated into English. In 1827 she married a physician named Flygare, and in 1841, after the death of her first husband, she married J. G. Carlén (q.v.), a lawyer and poet. In 1878 she published a volume of *Reminiscences of Swedish Literary Life*. She had clear insight into the conditions of human life, especially of life in the middle class, and she describes it with admirable fidelity.

CARLÉN, JOHAN GABRIEL, *yō'hân gâ'brē-ĕl*, Swedish poet and romancer: b. Westgotland, Sweden, 1814, July 9; d. Stockholm, 1875, July 6. He was the second husband of Emilia Carlén (q.v.), and was the author of *Romanser Svenska Volklifet* (*Romances of Swedish Life*) (1840); etc.

CARLETON, *kârl'ton*, SIR GUY, LORD DORCHESTER: 1724, Sep. 3—1808, Nov. 10; b. Strabane, Ireland: general. He served in the German campaign 1757, at the siege of Louisburg 1758, and under Wolfe at Quebec 1759; was wounded at the siege of Belleisle, and again at Moro Castle, Havana; became lieut.-gov. of Quebec, 1766, gov. of that prov. 1774, and maj.-gen. 1772. He attempted to retake Ticonderoga and Crown Point 1775, Oct., but was defeated and nearly captured. He was knighted for defending Quebec, 1775, Dec. 31, from the assault in which Gen. Montgomery was killed; drove the Americans from the prov., and defeated Arnold's flotilla on

Lake Champlain, 1776, Oct. 13. C. was superseded by Burgoyne 1777, but succeeded Clinton as commander-in-chief of the forces in America, 1781, and did what he could to mitigate the severities of the war. He was created Baron Dorchester 1786, Aug. 21, and was gov. of Brit. N. America 1786–96.

CARLETON, Henry Guy, American journalist and dramatist: b. Fort Union, New Mexico, 1855, June 21. He pursued journalism in New Orleans and New York, and has written several plays, including *Memnon, a Tragedy*; *Victor Durand* (presented 1884); *The Pembertons* (presented 1890); *The Lion's Mouth* (1890); *Ye Earlie Trouble* (1891); *Princess of Erie* (1892); *A Gilded Fool* (1892); *The Butterflies* (1894); *That Impudent Young Couple* (1896); *Ambition* (1896); *Colinette* (1898); *Jack's Honeymoon* (1903); etc.

CARLETON, James Henry, American soldier: b. Maine, 1814; d. San Antonio, Texas, 1873, Jan. 7. In 1839, February, he took part in the 'Aroostook war,' relative to the northeast boundary of the United States, and later was commissioned second lieutenant in the 1st United States Dragoons. In 1846 he took part in Kearny's expedition to the Rocky Mountains, served on Gen. Wood's staff in the Mexican war, receiving the brevet rank of major for gallantry at Buena Vista; and later was chiefly employed in exploring expeditions and against hostile Indians. In 1861 he was ordered to southern California, raised the famous 'California column,' and marched across the Yuma and Gila deserts to Mesilla on the Rio Grande. As commander of the Department of New Mexico he was active in a number of severe engagements. For his services he was brevetted major-general, 1865, March 13, became lieutenant-colonel of the 4th Cavalry, 1866, July 31, and was promoted colonel of the 2d Cavalry, 1868, June, and ordered with his regiment to Texas. He wrote *The Battle of Buena Vista* (1848).

CARLETON, Will, American poet: b. Hudson, Mich., 1845, Oct. 21. He is best known in literature by his ballads of home life, many of them having gained great popularity. His books include *Poems* (1871); *Farm Legends* (1875); *City Ballads* (1888); *City Legends* (1889); *City Festivals*; *Rhymes of Our Planet*; *The Old Infant, and Similar Stories*; *Young Folks' Centennial Rhymes*; *Songs of Two Centuries*, poems (1902); etc.

CARLETON, William: 1798–1869, Jan., b. Prillisk, county Tyrone, Ireland: popular writer of Irish tales. Bred and educated among the peasantry, and having had some scanty instruction in a hedge school, he, in his 17th year, went to an academy which a relative had opened at Glasslough, where he remained two years. Afterward a vague ambition led him to Dublin, where he arrived with only some three shillings in his pocket, and where, 1830, he published his *Traits and Stories of*

the Irish Peasantry. Their freshness of style won favor, as did a second series, 1832; and, in 1839, he published a powerful story, entitled *Fardorougha the Miser,* in several passages of which, however, his humor becomes extravagant. Subsequently Carleton published a series of tales (3 vols., Dub. 1841), mostly of pathetic interest, but including a very genial and humorous sketch of the *Misfortunes of Barney Branagan.* The story of *Valentine M'Clutchy,* 1845, is half-political and half-religious in its tendency, defending the Irish Rom. Cath. priesthood, and advocating repeal of the Union. Other narratives—*Rody the Rover,* 1846; *The Black Prophet,* 1847; and *The Tithe Proctor,* 1849—show the author's genius. *Willey Reilly,* 3 vols., appeared 1855, and *The Evil Eye,* 1860. Carleton is the true historian of the Irish people, by reason of his experience and of his sympathy; and his style is graphic and picturesque. He received a government pension of £200 a year, and on his death the queen granted a pension of £100 to his widow.

CARLI, *kâr'lē,* Giovanni Rinaldo: 1720, Apr.—1795, Feb.; b. Capo d'Istria: Italian economist and archæologist. Educated at home and at Flambro in the Friuli, he was, in his 24th year, appointed prof. of astronomy and navigation at Padua. In 1754, he published the first vol. of his great work *On the History of the Coins and Currency, and on the Institution of the Mints of Italy,* the fourth and last vol. of which appeared six years later. The book treats of the monetary history of Italy from the fall of the Western Empire until the 17th c., and is profusely illustrated with representations of coins, national and foreign, circulating in Italy during the various ages; and their value as compared with the price of provisions at different periods is also calculated. His merits as a financier were not overlooked. He was made pres. of the council of commerce and public economy at Milan, and afterward pres. of the new council of finances, into which branch of administration he introduced many reforms. To his influence was due the abolition of the inquisitional tribunal. He also wrote some valuable works on Istrian and other antiquities; dissertations on classical subjects; against sorcery; against Rousseau's theory of natural religion, etc. His works, exclusive of his *Italian Antiquities,* were published in 19 vols. 8vo. (Milan, 1784–94).

CARLIN, *kâr'lĭn,* Thomas, American politician: b. Kentucky, 1790; d. 1852, Feb. 2. He removed to Illinois in 1813, and gradually accumulated wealth, and became known and respected among the scattered population about him. He was elected governor in 1838, and retained that office for four years, during a period of unusual and violent political excitement. Illinois, having engaged largely in internal improvements, suffered severely from the commercial revulsion which was then paralyzing the whole country. She was much in debt, and had within her borders no specie, and no available means of payment.

The discussion of the slavery question, too, was then furious, and had just led to the tragic death of E. P. Lovejoy. At the same time the Mormons took up their position at Nauvoo, and politicians were beginning those movements for partisan ends which seemed likely to throw the State into anarchy, and which ended ere long in the violent death of the Mormon leader. That Gov. Carlin, amid such a condition of affairs, was three times re-elected to the chief magistracy, affords a sure indication both of his popularity and his force of character.

CARLINE, *kâr'lĭn*, or CAROLINE, *kăr'o-līn* [named from *Carlo* VI. of Naples]: silver coin current in Italy, worth about seven cents.

CARLINES, n. plu. *kâr'lĭnz*, or CARLINGS, *kâr'lĭngz* [F. *carlingue*]; in a *ship*, short pieces of timber ranging fore and aft from one deck-beam to another, used with other pieces called *ledges*, laid at right angles with them, to sustain and strengthen the deck of a ship.

CARLINE THISTLE, n. *kâr'lĭn* [F. *carline:* said to be after the famous *Charlemagne*, whose army was cured of the plague by it], (*Carli'na*): genus of plants of the nat. ord. *Compositæ*, closely allied to the true thistles, from which they are distinguished by the inner scales of the involucre spreading like rays, and being colored and shining. These involucral scales are remarkably hygrometric, expanding in dry and closing together in wet weather, and this property they retain for a long time; the heads of flowers are therefore often nailed on cottage-doors in many parts of Europe, to indicate the weather. The species, *C. acaulis*—said to have been shown by an angel to Charlemagne as a cure for the plague in his army—grows on hills and mountains, especially in calcareous soils in the middle latitudes of Europe. It has a very short stem, and very large heads of flowers, and was formerly in high repute for the medicinal virtues of its root—which is in large doses a drastic purgative—but its use is now almost confined to veterinary practice.—It grows mostly in poor soil. It has a stem about a foot high; and many purplish heads of flowers set amid straw-colored rays.

CARLING, *kâr'lĭng*, SIR JOHN, Canadian statesman: b. 1828. He was receiver-general of Canada in 1862; minister of works and agriculture, Province of Ontario 1867–71; postmaster-general 1882; minister of agriculture 1885–92; minister without portfolio 1892–5; and became a member of the senate in 1896.

CARLISLE, *kâr-līl':* capital of Cumberland co., PENN., on the Cumberland Valley and Gettysburg and H. railroads 19 m. w. by. s. of Harrisburg. It is in a fertile limestone valley between the Kittatinny and South Mountains. Carlisle was begun 1751, and two years later had five log houses, but soon became a military post and grew in importance. Washington's headquarters were here during the whisky insurrection, 1794. Here Dickinson College was founded 1783 by the Presbyterians; it was suspended 1816, revived

1822, and transferred to the Methodists 1833. United States barracks, sufficient for 2,000 men, were built near Carlisle 1777, chiefly by the Hessians captured at Trenton; long used as a school of cavalry practice, they are now devoted to the training of Indians. Carlisle was shelled by the Confederates, 1863, July 1, at night. It has several churches, banks, weekly papers, machine shops, and a car factory. Pop. (1910) 10,303.

CARLISLE: parliamentary and municipal borough, episcopal city, and ancient town in North Cumberland, Eng.; capital of the county, 12 m. e. of the Solway Firth, 300 m. n.w. by n. London, 101 m. s. of Edinburgh, 60 w.s.w. of Newcastle. It is a chief station on the w. railway route from London to Edinburgh, and is the terminus of seven different lines of railway. It stands on an eminence in a wide plain at the confluence of, and nearly surrounded by, the Eden, Caldew, and Peteril. Many fine new streets and buildings have been lately added to the city. The court-house and county jail is a handsome pile; a public hall was opened 1875; the fine Carlisle bank was built 1876. The chief branches of industry are cotton, gingham, chintz, check, and hat manufactures; and fancy biscuits are largely made. There is salmon fishing in the Eden. The castle was founded 1092, and is now a barrack; the remains of the keep form a massive lofty tower, with a very deep well. Mary Queen of Scots was confined in the castle after the battle of Langside. There was formerly a canal of 11 m., from Bowness on the Solway Firth to Carlisle; but its bed was some years ago converted into a railway, from which a line branches to the newly formed part of Silloth (q.v.), on the Solway. Pop. 40,000. Carlisle returns one member to parliament. It was the seat of the kings of Cumbria. The Picts and Scots ravaged it. About 900, it was destroyed by the Danes, after which it remained desolate for 200 years. Thence till the union of England and Scotland, it was closely connected with the border wars, and underwent many sieges. To its being long a fortified border town it owed much of its importance and privileges, but it declined greatly after the union. The C. corporation, in 1745, proclaimed Prince Charles king of Great Britain. The Duke of Cumberland afterward took the city, and punished the chief actors with death, and the inhabitants with other cruelties. In 1133, Henry I. made Carlisle a bishopric.

CARLISLE, Frederick Howard, fifth Earl of: 1748, May 28—1825, Sep. 4: statesman. A man of fashion and pleasure in youth, his appointment as one of three commissioners sent by Lord North to America, 1778, to treat with the revolted colonies aroused the jeers of the opposition. The embassy failed of its purpose, but Carlisle urged conciliatory measures in the house of lords. He was viceroy of Ireland 1780–82; afterward lord privy seal; opposed Pitt 1791–2; supported the war with the French republic 1792; advocated the union with Ireland 1800–1, and opposed the enactment of the Corn laws 1815. He published two tragedies, *The Father's Revenge* and *The Stepmother;* also poems,

1773, 1801, etc., and pamphlets. Carlisle was a connection and guardian of Lord Byron, who dedicated to him *Hours of Idleness*, and complimented him therein, attacked him in *English Bards and Scotch Reviewers*, and apologized in *Childe Harold*, canto iii. He died at Castle Howard.

CARLISLE, *kar-līl'*, George William Frederick Howard, Earl of, K. G.: 1802; Apr. 18—1864, Dec. 5. Educated at Eton and Oxford, he, 1821, obtained the Chancellor and Newdegate prizes for his Latin and English poems. He entered the public service 1826 as an attaché. In 1830, he was elected one of the representatives of the important constituency of Yorkshire. He was chief secretary for Ireland (1835-41) under Lord Melbourne. Rejected, 1841, by the West Riding, he was again elected, 1846, and remained one of its representatives until the death of his father (1848) called him to the house of lords. Under Lord John Russell's ministry (1846-52) he was chief commissioner of woods and forests, and afterward chancellor of the duchy of Lancaster. He was appointed lord lieutenant of Ireland (1855-58), reappointed 1859. He died at Castle Howard.

CARLISLE, John Griffin: 1835, Sep. 5— —— ——; b Campbell co., Ky.: politician. He was in early life a school-teacher; was admitted to the bar 1858. He was a member of the State house of representatives (1859-61), and of the State senate (1866-71), lieut. gov. (1871-75). He was elected to the U. S. house of representatives, 1879, 81, and 83, and in the latter year was chosen speaker. He became U. S. senator 1890, and in 1893 President Cleveland appointed him sec. of the treasury.

CARLISTS: see Carlos de Bourbon: etc.

CARLOS, *kar'lōs*, Don, Infante of Spain: 1545, July 3—1568, July 24; b. Valladolid; son of Philip II. After his recognition as heir to the throne, 1560, Don Carlos was sent to study at the Univ. of Alcala de Henares, where, however, he profited so little, that the king, regarding him as unqualified to reign, invited a nephew, the archduke Rudolf, to Spain, intending to make him heir to the throne. Excluded from all participation in the government, Don Carlos conceived a strong aversion toward the king's confidants, and especially was unwilling that the Duke of Alva should have the government of Flanders. In confession to a priest, on Christmas eve, 1567, he betrayed his purpose to assassinate a certain person; and as the king was believed to be the intended victim, this confession was divulged. The papers of Don Carlos were seized, and being tried, he was found guilty of conspiring against the life of the king, and of traitorously endeavoring to raise an insurrection in Flanders. The sentence was left for the king to pronounce. Philip declared that he could make no exception in favor of such an unworthy son; but sentence of death was not formally recorded. Shortly afterward he died, and was interred in the Dominican monastery, El-Real, at

Madrid. The suspicion that he was poisoned or strangled, has no valid evidence. Schiller, in his tragedy *Don Carlos*, has widely departed from historical testimonies.

CAR'LOS, San: town of Venezuela, S. America, 120 m. s.w. of Caracas. The town is handsome and well laid out. The inhabitants are engaged chiefly in the rearing of cattle, and the cultivation of indigo, cotton, and coffee, of which there are still considerable plantations in the neighboring savannahs. Pop. considerably less than formerly, when it was about 10,000.

CARLOS DE BOURBON, Don Maria Isidor: 1788, Mar. 29—1855, Mar. 10: second son of Charles IV. of Spain. He was educated chiefly by priests. After the expulsion of the French from Spain, his brother, Ferdinand VII., re-ascended the throne; but having married thrice without issue, Don C. began to cherish the hope of succeeding his brother. An insurrection in his interest broke out in 1825, in Catalonia; but was put down, Don C. himself not participating in it. A fourth time, however, the indefatigable Ferdinand married, and the result was a daughter, the Infanta Maria Isabella (late queen of Spain), born 1830, Oct. 10. Now, as the Salique Law, excluding females from succession to the throne, had been abrogated, the hopes of the Carlists, as the followers of Don C. were called, were destroyed. During the illness of the king, 1832, Sep., the Carlists succeeded so far as to win from him a re-institution of the Salique Law; but he revoked it again as soon as he had partially recovered, and thus Don C. was again disappointed. As he still continued his agitation, he was banished, 1833, to Portugal, and soon afterward was commanded to reside in the Papal States. But before C. had embarked for Italy, King Ferdinand VII. died 1833, Sep. 29. Don C. was now recognized as heir to the throne of Spain, not only by the Carlists, but also by Dom Miguel in Portugal; and having refused to obey the queen-regent's order for his deportation to Italy, he was declared a rebel, 1833, Oct. 16. By the quadruple alliance of Spain, Portugal, England, and France, both C. and Dom Miguel were banished from Portugal, and, 1834, June, the former embarked for England. In the following month, he returned to the continent, passed in disguise through France into Spain, where he excited an insurrection in the n. provinces, but was ultimately compelled to escape into France. In 1836, his claims to the throne were unanimously rejected by the constituent cortes. In 1844, he abdicated in favor of his eldest son; and died at Trieste.

Don Carlos (Luis Maria Fernando), his son, better known as the Count de Montemolin: 1818–61: a second pretender to the throne. He made an attempt, 1849, to pass under a disguise through France into Spain, but failed. In 1860, a Carlist insurrection was once more attempted, in consequence of which the Count de Montemolin and his brother were arrested, but liberated after the former had signed a renunciation of all his claims to the Spanish throne, which renunciation he soon repudiated.

The present representative of the Carlist pretensions is

the nephew of Don Luis Maria Fernando, being son of Don Luis's brother Juan, bearing the name of CARLOS, Don MARIA DE LOS DOLORES JUAN ISIDOR JOSEF FRANCESCO QUIRINO ANTONIO MIGUEL GABRIEL RAFAEL: b. 1848. On his behalf, Carlist risings—speedily repressed—took place in 1869, 1870, and 1872; but the insurrection headed by Don Carlos, after the abdication of King Amadeo, 1873, proved much more formidable, and kept the n. provinces of Spain in great confusion till the beginning of 1876, when it was crushed.

CARLOVINGIANS, *kâr-lō-vĭn'jĭ-anz:* second dynasty of Frankish kings. The origin of the family is traced to Arnulph, Bishop of Metz, who died 631. His son, Anségise, married a daughter of Pepin, of Landen in Austrasia. His sons, Martin and Pepin d'Heristall (q.v.), as the greatest territorial lords in Austrasia, were called to the office of mayor of the palace. Martin was assassinated; Pepin, by force of arms, compelled the weak Merovingian king, Theodoric III., to invest him with the office of mayor of the palace in all the three Frankish states, Neustria, Austrasia, and Burgundy. Pepin allowed the Merovingian kings to remain upon the throne, but they were kings only in name. He died 714, Dec. 17, and left as his successor his young grandson, Theodoald; but Charles Martel (q.v.), natural son of Pepin, was made mayor of the palace by the Austrasians, and in this capacity subjected the three states to his power. He died 741.

Charles Martel's two sons, Carloman and Pepin le Bref, divided the kingdom, although for a time the nominal Merovingian dynasty still subsisted; but Pepin at last formally assumed the royal power and was crowned King of the Franks. 752, May 3. This is the formal commencement of the Carlovingian dynasty. Pepin began the conquest of Italy.

Pepin's sons, Carloman and Charles the Great or Charlemagne (q.v.), succeeded him, of whom the latter soon reigned alone, and prodigiously extended his dominions. In 800, Pope Leo III. set upon his head the crown of the Western Roman Empire.

Charlemagne divided his dominions among his sons, of whom, however, only one, Louis le Débonnaire, survived him, who, in the list of the kings of France, appears as Louis I., but who was properly emperor and king of the Franks With Charlemagne, however, the high abilities of his family suddenly disappeared, and his successors showed much weakness of character. Family feuds broke out during the life of Louis le Débonnaire, who had divided his dominions in part among his sons, and he terminated an inglorious reign in 840.

By a treaty concluded 843, Aug., Lotharius I., eldest son of Louis, obtained the imperial crown and the kingdom of Italy, with Lorraine, Franche Comté, Provence, and the Lyonnois; Louis, his brother, called Louis the German, obtained the German part of his father's dominions; and Charles the Bald, son of a second marriage, obtained Neustria, Aquitania, and the *Spanish Mark,* and may almost be

regarded as the founder of the French monarchy. The emperor Lotharius I. died in 855.

The dominions of Lotharius were again divided—his eldest son, Louis II., being emperor and king of Italy, and his two other sons kings of Lorraine and of Provence, but their kingdoms reverted to the emperor.

Charles the Fat, a son of Louis the German, having become emperor, was elected by the French nobles to be their king 882; and being previously in possession of Italy and Germany, united under his sway great part of Charlemagne's empire. But he was a weak monarch, and was deposed 887.

The imperial dignity passed to another family by the marriage of the daughter of the emperor Arnulph with Fritzlar, Count of Franconia. The French dynasty, of which Charles the Bald may be deemed the founder, continued in a succession of weak monarchs for about a century, till it terminated with the reign of Louis V., on whose death, Hugh Capet, the most powerful nobleman in France, seized the crown 987. The Carlovingian kings had for some time previous possessed no real power. A subsequent marriage, however, connected their family with that of the Capets, and enabled the kings of France to trace their descent from Charlemagne.

The Carlovingian dynasty figures in the early history of France as the ally of the church. It aided the popes against the Lombards; made war on the Aquitanians, who pillaged and despoiled the churches; established the temporal power of the successors of St. Peter; subdued and converted the still pagan Saxons; and fought the Mohammedans in Spain. The church was not ungrateful: it sanctioned, by benediction and prayer, the conquests of this powerful family; in various ways impressed its sacred stamp of approbation upon it; and for its sake resuscitated the imposing idea of an empire of the west. But this alliance, advantageous to the policy of kings like Pepin le Bref and his son Charlemagne, because they had genius, vigor, and design, became at a later period, under their feeble successors, a chief cause of the overthrow of the dynasty, for the clergy after 814 grew stronger and more exacting every day, and forced the monarchs to new concessions.

(The word Carlovingians is formed on a false analogy from Merovingians (q.v.) or Merwings; it should be *Carolings* or *Karlings*, and means pertaining to, or descendants of Karl the Great, or Charlemagne.)

CARLOVITZ, or KARLOWITZ, *kâr'lo-vitz:* town of the Austrian empire, in the 'kingdom' or province of Slavonia. It is on the right bank of the Danube, about 8 m. s.s.e. of Peterwardein, and is noted for its excellent wine, and for the treaty concluded here in 1699. The wine—especially the red variety—ranks with the best and strongest obtained in Hungary, and is largely exported. C. is the seat of the Greek abp. for the Austrian dominions. Pop. 5,000.

The important treaty of peace of C. concluded 1699, between the allies, Austria, Russia, Poland, and Venice on

the one side, and the Porte on the other, provided that Austria should repossess the territories captured by the Turks during two centuries, including Hungary, Slavonia, etc.; that Venice should hold the Morea; that Poland should take back Podolia and part of the Ukraine; and that Russia should have the territory of Azov.

CAR'LOW: small inland county of Ireland, in Leinster province; about 346 sq. m., of which six-sevenths are arable. Carlow, except in the s. extremity, where it is hilly, is a triangular fertile level, or gently undulating plain, between the Wicklow and Wexford range of hills on the e., and the highlands beyond the Barrow on the w. The chief rivers are the Barrow and Slaney. Carlow consists chiefly of granite, covered in the middle plain, or richer tracts, by limestone gravel, on which are fine loams and pasture. In the uplands the soil is gravelly. Lower, carboniferous limestone crops out in the valley of the Barrow. On the w. side of the county begins the great coal district of Leinster. The chief crops are oats, potatoes, barley, and wheat. There are many dairies on the plains. The chief exports are corn, flour, meal, butter, etc. Along the Barrow, which falls more than a foot per mile, are a great many extensive corn-mills. The chief towns are Carlow, Tullow, and Bagenalstown. At Old Leighlin a synod was held 630, to settle the time of Easter. Several conflicts occurred in the county during the Irish rebellion of 1798. The chief antiquities of Carlow are cromlechs, castles, and the cathedral church of Old Leighlin. A cromlech near Carlow town has a covering stone of 23 ft. long, and of nearly 90 tons. Pop., (1901) 37,748.

CARLOW, *kâr'lō:* capital town of Carlow county, Ireland; at the confluence of the Burren and the Barrow, 56 m. s.w. of Dublin by rail. It is a well-built town, with two principal streets, from which branch many smaller ones, and a suburb, Graigue, in Queen's county, on the opposite side of the river, with which it is connected by a bridge. It has a Rom. Cath. cathedral and divinity college. Carlow has extensive flour-mills, and is the emporium for the agricultural produce of the district, largely exported from this place. There are remains of a castle, picturesquely situated on an eminence on the Barrow, founded in 1180 by Sir Hugh de Lacy. In 1361 the Duke of Clarence established the exchequer of the kingdom in this place. It constituted one of the boundaries of the PALE, beyond which the king's writ was not recognized by the 'Irishry.' Its first charter was granted in the 13th c. by William Marshall, Earl of Pembroke. The town grew up around this castle, which was several times besieged by, and alternately in the possession of, the English and Irish. The castle (one of great extent) was in the possession of the insurgents in 1650, when it was closely invested by General Ireton and the republican army. The garrison surrendered on conditions to Sir Hardress Waller, whom Ireton had left to conduct the siege. It was then dismantled; and about one half of this once stately castle now remains

a picturesque ruin. In the Irish insurrection of 1798, the insurgents attacked the town, but were repulsed by the garrison and yeomanry, and 600 of them killed. The Barrow is here navigable for small craft to its junction with the grand canal at Athy. Pop. about 7,000.

CARLSBAD, *kârls'bât*, or KAISER-KARLSBAD, *kī-zėr-kârls'bât:* town in Bohemia, celebrated for its hot mineral springs, frequented in summer by visitors of the most aristocratic character from all parts of Europe. The permanent population does not amount to more than about 10,000, who are very industrious, making carpets, knives, scissors, needles, woodwork, and articles of Bohemian glass, such as are likely to induce visitors to purchase. The visitors in a season, which usually lasts from June 15 to Aug. 15, amount to 15,000 or 18,000. The wells have been frequented from a very early period, but have been of great celebrity since the 14th c. The scenery is extremely beautiful. The town is well built, the accommodation for guests good, and the place free from some of the abuses too common at other German spas. No gaming-houses are here. The temperature of the hot springs varies from 117° to 165° F. The principal spring, the Sprudel, has a very large volume, and is forced up to a height of 3 ft. from the ground. Altogether the daily flow of the springs of Carlsbad is estimated at 2,000,000 gallons. The principal ingredient in the water is sulphate of soda. The whole town of Carlsbad appears to stand on a vast caldron of boiling-water, which is kept from bursting only by the safety-valves that the springs provide. On one occasion, after an explosion, poles of 30 fathoms in length, thrust into the aperture, did not reach the bottom. A congress of German powers was held here, 1819, Aug., in which various resolutions, denunciatory of a free press and liberal opinions, were arrived at, and measures of repression determined on.

CARLSBURG, or KARLSBURG, *kârls'bûrg:* town of Transylvania, on the right bank of the Maros, here crossed by a bridge some 200 yards in length, 48 m. s. of Klausenburg. It is built partly on a hill, and partly in a valley, is fortified, and has a citadel surrounded by walls with bastions. Gold and silver, from the mines of Transylvania, are purified and coined here. The only manufacture of importance is saltpetre. Maros Porto, the chief shipping-place for Transylvanian rock-salt, is within half a mile of the town. Carlsburg occupies the site of the ancient *Apulum*, remains of which are still found. Pop. about 8,200.

CARLSCRONA, *kârls-krô'na:* capital of the province of C., in Sweden; on the rocky island of Trotsö, and its adjoining islets in the Baltic, which are connected by bridges; lat. 56° 9′ n., long. 15° 35′ e. The town was built in 1680 by Charles XI., who gave it his own name, and conferred upon it several important privileges, besides making it the great naval station and arsenal of Sweden, instead of Stockholm. It has a magnificent harbor, with a sufficient

depth of water to float the largest vessels. The only practicable entrance for large ships is defended by two strong forts. The dry docks, blasted out of the granite rock at vast expense, are an attraction to strangers. The inhabitants are employed chiefly in connection with the arsenal. Pop., (1901) 24,607.

The province of Carlscrona or Blekinge is in the s. of Sweden; lat. 56°—56° 30′ n., long. 14° 30′—16° e.; 1,164 sq. m. It has the Baltic on its s. and e. margins. It is hilly without being mountainous, and generally fertile, yielding rye and potatoes abundantly, also wheat, oats, and peas. The fisheries employ many of the inhabitants. Pop. (1901) 146,787.

CARLSHAMN, *kârls'hâm:* fortified town on the s. coast of Sweden, about 30 m. w. of Carlscrona, at the end of a beautiful valley. The harbor is small but secure, and a considerable trade in iron, timber, pitch, and tar is carried on. There are manufactures of sail cloth, tobacco, hats, soap, and leather, there are also dye-works and ship-building yards. Pop. 7,191.

CARLSRUHE, *kârls'rô:* capital of the grand duchy of Baden, a few m. e. from the Rhine. It was founded by the Markgraf Charles-William of Baden-Durlach, 1715, and built on a curious and regular plan in connection with the palace, as the centre from which the streets diverge in the shape of an extended fan. The streets are wide and well paved. There are a number of fine buildings; flourishing educational institutions; the court library, 80,000 vols.; a public library, 90,000; and valuable collections of antiquities, objects of natural history, etc. An aqueduct from the Durlach supplies the town with water. In the market-place, the finest of the public squares, a stone pyramid incloses the remains of the founder of the city. The manufactures include machines of various sorts, engines, locomotives, railway carriages and wagons, jewelry, carpets, chemical products, and cloth. Carlsruhe is generally spelt *Karlsruhe.* Pop. 97,185.

CARLSTAD, *kârl'stât:* town of Sweden, on the island of Tingvalla, in Lake Wenern, about 160 m. w. of Stockholm. It is connected with the mainland by two bridges, one of which is large and very handsome. The town is well built, has a cathedral, cabinet of natural history, etc., and commands extensive views of the most beautiful scenery. Its trade is large, consisting in exports of iron, copper, timber, and corn, Pop. (1901) 12,250.

CARLSTADT: town of Croatia, in Austria; in a rich plain, 33 m. s.w. of Agram, and on the navigable river Kulpa. It has a fortress, and is the seat of a Greek bishopric. There is a transit trade in wine, corn, and flour. Pop. 5,300.

CARLSTADT, or KARLSTADT, *kârl'stât,* or KAROLOSTADT (real name ANDREAS RUDOLF BODENSTEIN): 1480–1541. Dec. 24, reformer. He took the name of his native town in Franconia. After studying at Rome and else-

where, he came to Wittenberg, and rose to be canon, archdeacon, D.D. 1510, dean or rector 1511, and prof. of theology 1513. He conferred the doctorate on Luther 1512; again visited Rome 1515–16; eagerly embraced the principles of the Reformation; disputed unsuccessfully with Eck at Leipzig on grace and free will, 1519; was included in the bull which condemned Luther, 1520; appealed to a general council; advocated the marriage of the clergy, and was the first to practice it. His learning made him at first a valuable aid to Luther; but while that leader was at the castle of Wartburg, Carlstadt's zeal broke all bounds, and a mob, led or encouraged by him destroyed the altars, images, and crucifixes in the great church at Wittenberg. Scandalized by these disorders Luther preached against them at Jena. Carlstadt obtained the pulpit at Orlamünde, put himself in open opposition to Luther, and was banished from Saxony by the elector Frederick, 1524, Sep. He now denied the real presence in the Lord's supper, and being followed by Zwingli, began the controversy which ended in the schism between Calvinists and Lutherans. Carrying his Protestantism to all lengths, he abandoned his doctor's title, denounced human learning as useless in God's service, and glorified menial labor. Suspected of encouraging the peasants' revolt in Franconia, he became a wanderer, and was reduced to great distress. Luther, on his appeal, procured him permission to return and an asylum at Kemberg near Wittenberg, on condition of his silence. This irksome restraint his fiery spirit endured for nearly three years, but broke from it, 1528, in some violent published utterances. Again a fugitive, and believed to have plotted against Luther's person, he fled to Friesland, and at last found a refuge at Zurich, where Zwingli welcomed and assisted him. Apparently he learned the wisdom of moderation, either from his woeful experiences or from the influence of 'the calm Helvetian,' for the remainder of his life seems to have been less tumultuous. After a few years as vicar of Altstettin and as archdeacon and preacher at Zurich, he became prof. of theology at Basel 1534, and retained this post till death. His followers in Germany, for a time numerous, were called Carlstadtians or Sacramentarians.

CARL'TON, Charles, Anglo-American educator: b. Eythorne, Kent, England 1821, Aug. 21; d. Bonham, Texas, 1902, Feb. 13. He removed to Toronto, Ontario, spent several years as a seaman and subsequently while working on a farm at Fredonia, N. Y., studied for the ministry, and was graduated from Bethany College, W. Va., in 1849. He was successively pastor in Georgetown, Ky.; Lexington, Mo.; Little Rock and Van Buren, Ark.; and in 1867 removed to Bonham which continued his home for the rest of his life. There he established a co-educational school called Bonham Seminary, which in 1882 changed its name to Carlton College, and became an institution for women solely. He was a prominent leader in the Christian denomination in Texas.

CARLYLE.

CARLYLE, *kar-līl* or *kăr-līl′*, THOMAS: 1795, Dec. 4—1881, Feb. 5; b. in the village of Ecclefechan, parish of Hoddam, Dumfriesshire, Scotland. Educated first at the village school, afterward at Annan grammar school, he passed to Edinburgh Univ. in his 14th year, with a view to entering the ministry of the Scottish Church. Here he studied irregularly, but with amazing avidity, and in very various fields. The views he came to adopt precluded him from becoming a minister; and for a time he taught a school at Kirkcaldy. He also began the study of law; but after a period of work as a private tutor (having the brilliant Charles Buller as pupil), he embraced literature as a profession. His first efforts were contributions to Brewster's *Encyclopædia*. In 1822, he completed a translation of Legendre's *Geometry*, to which he prefixed an Essay on Proportion, mathematics having, during his college years, been a favorite study with him. In 1823–24, had appeared in the *London Magazine* his *Life of Schiller*, and, during the same year, his translation of Goethe's *Wilhelm Meister*. In 1825, the *Life of Schiller* was recast, and published in a separate form. It was very highly praised; indeed, one can discern in the criticisms of the book certain indications of the genius of Carlyle. The translation of *Wilhelm Meister* met with a somewhat different fate. De Quincey, in one of his acrid and capricious moods, fell foul both of Goethe and his translator; while Lord Jeffrey, in the *Edinburgh Review*, admitting Carlyle's abilities, dealt severely with Goethe's book. In 1826, Carlyle married Miss Welsh, a lineal descendant of John Knox, and in 1827, Jan., appeared his *Specimens of German Romance* (4 vols.). He began to write for the *Edinburgh Review* 1827, and was a contributor also to the *Foreign* and *Foreign Quarterly Reviews*. He was an unsuccessful candidate for the professorial chairs of moral philosophy at St. Andrews, of rhetoric in University College, London, and of Astronomy at Edinburgh. From 1828–34, he resided chiefly at Craigenputtock, a small property in Dumfriesshire, belonging to his wife—the 'loneliest nook in Britain,' as he himself says. Here Carlyle revolved in his mind the great questions in philosophy, literature, social life, and politics, to the elucidation of which—after his own singular fashion—he applied himself through life. Here also he commenced to write the splendid series of critical and biographical essays which first familiarized Englishmen with the riches of modern German thought. For this work he was incomparably better fitted than any man then living, and he was inspired by the conviction that the literature of Germany in depth, truthfulness, sincerity, and earnestness of purpose, was greatly superior to what was admired and relished at home. Gifted, moreover, in a degree altogether unexampled, with a talent for portraiture, he soon painted in ineffaceable colors on the British memory, the images of Schiller, Fichte, Jean Paul Richter, and other foreign magnates, until then almost unheard of. Gradually, educated circles awoke to the fact that a literary Columbus

had appeared among them, who had discovered a 'New World' of letters, the freshness and grandeur of which were sure to attract, sooner or later, multitudes of adventurous spirits. One of his most beautiful, eloquent, and solid essays written at Craigenputtock, was that on *Burns* (*Edinburgh Review*, 1828). It has given the tone to all subsequent criticism on the Scottish poet. The article on *German Literature*, in the same periodical, is a masterly review of a subject, the importance of which Carlyle at length succeeded in compelling his countrymen to acknowledge. But his *chef-d'œuvre*, written on his moorland farm, was *Sartor Resartus* ('The Tailor done over,' the title of an old Scottish song). This work, like all his after-productions, an indescribable mixture of the sublime and the grotesque, was offered to various London firms, and rejected on the advice of their sapient 'tasters,' and at length published in successive portions in *Fraser's Magazine* (1833–4). It professes to be a history or biography of a certain Herr Teufelsdröckh ('Devil's Dirt'), prof. in the Univ. of Weissnichtwo ('Kennaquhair'), and contains the manifold opinions, speculations, inward agonies, and trials of that strange personage or rather of Carlyle himself. The whole book quivers with tragic pathos, solemn aspiration, or riotous humor. In 1834, Carlyle removed permanently to Chelsea. In 1837 appeared the first work which bore the author's name, *The French Revolution, a History.* Nothing can be more gorgeous than the style of this 'prose epic.' A fiery enthusiasm pervades it, now softened with tenderness and again darkened with grim mockery, making it throughout the most wonderful image of that wild epoch. Carlyle looks on the explosion of national wrath as a work of the divine Nemesis, who 'in the fulness of times' destroys, with sacred fury, the accumulated falsehoods of centuries. To him, therefore, the Revolution is a 'truth clad in hell-fire.' During the same year, he delivered in London a series of lectures on *German Literature;* in 1838, another series on *The History of Literature, or the Successive Periods of European Culture;* in 1839, another on *The Revolutions of Modern Europe;* and a fourth in 1840, on *Heroes, Hero-worship, and the Heroic in History;* of these only the last has been published. Meanwhile, the first edition of his *Miscellanie* (contributions to the reviews) had appeared 1838, and his *Chartism* 1839; in 1843 followed *Past and Present,* which, like its predecessor, showed the deep, anxious, sorrowful interest Carlyle was taking in the actual condition of his countrymen. In 1845, he published what is by many considered his masterpiece—*Oliver Cromwell's Letters and Speeches, with Elucidations and a Connecting Narrative.* The research displayed in this book is something marvellous, but the author has been nobly rewarded for his toil inasmuch as his vindication of the Protector's character is most triumphant. To Carlyle has thus fallen the unspeakable honor of replacing in the Pantheon of English history the statue of England's greatest ruler. In 1850, the *Latter Day Pamphlets,* the fiercest, most sar-

donic, most furious of all his writings, came out. The violence of the language in those pamphlets offended many. Next year (1851) appeared the *Life of John Sterling*—a biography of intense fascination for the younger intellects of the age. In 1858–60 Carlyle published *The History of Frederick the Great*, which sketches the history of Germany from the middle ages, and throws a flood of light on the politics and condition of all Europe in Frederick's time. As rector of the Edinburgh Univ., he delivered, 1866, a memorable address to the students. Carlyle's last published work contains a brief sketch of *The Early Kings of Norway*, and discusses the credibility of *The Portraits of John Knox*. His views on the Franco-German war and on the Eastern question were made plain in letters to the *Times* in 1870 and 1876. In 1873, he received the Prussian order *Pour le Mérite;* and in 1875, he refused the offer of the order of the Bath. In the latter year, on his 80th birthday, an address was presented to Carlyle from above a hundred representative men and women in literature, science, and art, with a memorial gold medal; German scholars joining in a like tribute. He died at Chelsea. Carlyle had then long been recognized as one of the greatest of modern literary men. He was fitted rather to awaken and stimulate, than to guide. He was intolerant and strong in his prejudices; his judgments seem often perverse; and his political maxims may be disputed. But none will deny his genius or fail to see in his writings the fervid earnestness, the prophetic fire, which made him one of the great moral forces of the 19th c. His style was not less remarkable for its power and graphic effect than for its abruptness, ruggedness, and eccentricity. By his own wish, Carlyle's remains were buried in the churchyard of his native village. His excellent wife died 1866, and so, as he said, 'the light of his life had gone out.' A few weeks after his death, Mr. Froude, whom Carlyle had appointed his literary executor, published two vols. of *Reminiscences* by Carlyle, containing many sharp personal criticisms, which provoked much comment. In *Thomas Carlyle: A History of the First Forty Years of his Life* (1882), Mr. Froude continued the task of exhibiting Carlyle without partiality, not sparing his infirmities of temper; he subsequently published *Letters of Jane Welsh Carlyle* (3 vols. 1883); and *Thomas Carlyle: Life in London* (1884). In the last-named year was published the *Correspondence of Carlyle and Emerson* between 1834 and 1872. Other vols. of Carlyle's biography are promised. It is undeniable that these publications have dealt roughly with the popular estimate of Carlyle, and have seriously damaged his fame as a deeply sincere though rough reformer. Mr. Froude has been sharply blamed for bringing such infirmities of temper and such lack of magnanimity into open revelation. Probably the final verdict concerning this marvellous writer is not yet uttered. It cannot deny the splendor of Carlyle's genius, or the height of his moral ideals; yet hardly can it assign to him that

achievement of noble ideals which depends on an absolute sincerity of purpose. See Wylie, *Thomas Carlyle: the Man and His Books* (1881); Masson, *Carlyle Personally and in His Writings* (1885); *Lives* by Garnett (1887); Nichol (1894).

CARMACK, *kâr'măk*, Edward Ward, American politician: b. near Castilian Springs, Sumner County, Tenn., 1858, Nov. 5. He studied law, and after admission to the bar practised his profession at Columbia, Tenn. He was member of the State legislature in 1884; was on the editorial staff of the *Nashville American*, (1886–8), and in 1892 became editor of the *Memphis Commercial*. He served two terms in Congress as Democratic representative from the 10th Tennessee district 1897–1901, and in the year last named was appointed to the United States Senate.

CARMAGNOLA, Francesco, *frân-chĕs'kō kâr-mân-yō'la*, Italian *condotierre:* b. Carmagnola, about 1390; d. Venice, 1432, May 3. His real name was Bussone, but he adopted as his own the name of his birthplace. The son of a peasant, he was a herdsman in his youth; but enlisting in the service of the Duke of Milan (Filippo Maria Visconti), he rapidly rose in rank, and aided his master in regaining a great part of Lombardy, and in extending his possessions. The Duke, however, became suspicious of his loyalty, confiscated his property, cast his wife and children into prison, and banished him; upon which Carmagnola entered the service of the republic of Venice, from which he received the appointment of generalissimo. He wrested Brescia from the Duke of Milan, and entirely routed his army at the battle of Macalo in 1427. After the battle he released his prisoners, which was frequently done at that time by *condottierri*, but incurring the suspicions of the Venetian senate for doing so, and his subsequent military operations not proving successful, he was recalled to Venice, under the pretext that his advice was needed for affairs of state, placed under arrest, accused of treason, put to the torture and beheaded.

CARMAGNOLE, *kar-man-yōl:* a popular song and dance, notorious as the accompaniment of many excesses in the French Revolution. It was sung and danced with wild enthusiasm by crowds in the streets.

CAR'MAN, *kâr'măn*, Elbert S.: American editor: b. Hempstead, N. Y., 1836; d. New York, 1900, Feb. 28. He was graduated at Brown University in 1858, began contributing to the *Turf, Field, and Farm* and similar publications early in life, and became owner and editor of the *Rural New Yorker* in 1876. In connection with the last publication he established a farm at River Edge, N. J., where he gave much of his time to testing new plants, vines, and seeds, and also to originating new varieties of vegetables, fruits, and grains.

CARMAN, Ezra Ayers: American military officer: b. Metuchen, N. J., 1834, Feb. 27. He was graduated at the Western Military Institute, Kentucky, in 1855, and was assistant professor of mathematics in the University

of Nashville in 1855–6. He served through the Civil War in the Army of the Potomac and the Army of the Cumberland; and attained the rank of brigadier-general of volunteers. He was comptroller of Jersey City in 1871–5; clerk in the United States Department of Agriculture in 1877–85; and a member of the Antietam Battlefield Board.

CARMAN, William Bliss: Canadian poet and journalist: b. Fredericton, N. B. 1861, April 15. He was educated at the universities of New Brunswick, Edinburgh, and Harvard, and became connected with many New York and Boston papers, established the *Chap Book*, Chicago, 1894, and contributed poetry to many journals. His works in prose and poetry have been as follows: *Low Tide on Grand Pré* (1903); *Songs from Vagabondia* (with Richard Hovey, 1894); *Behind the Arras: A Book of the Unseen*, (1895); *A Sea Mark* (1895); *More Songs from Vagabondia* (with Richard Hovey, 1896); *Ballads of Lost Haven* (1897); *By the Aurelian Wall* (1898); *A Winter Holiday* (1899); *Last Songs from Vagabondia* (1900); *Christmas Eve at St. Kavins* (1901); *Ode for the Coronation* (1902); *From the Book of Myths* (1902); *Pipes of Pan No. I.* (1902); *Pipes of Pan No. II.* (1903); *Songs from a Northern Garden* (1904); *The Friendship of Art* (1904); *The Poetry of Art* (1905); *Collected Poems* (2 vols., 1905); *From the Book of Valentines* (1905).

CARMARTHEN: see Caermarthen.

CARMEL, *kâr'mel:* mountain at the end of a limestone ridge, 6 m. long, forming the only great promontory on the low coast of Palestine. It has a height of 1,810 ft. On the e. is the river Kishon, and the Plain of Esdraelon. Trees still grow abundantly on the mountain. The name Carmel means, *The Garden of God*, or, 'a very fruitful region.' Mount Carmel, the scene of Elijah's sacrifice, is renowned in Jewish history, and is often alluded to in the imagery of the prophets. On Mount Carmel there is a monastery, the monks in which are Carmelites (q.v.). The mountain's usual modern name, *Mar Elyas*, indicates its connection in the popular mind with the life of the great prophet.

CARMEL, Knights of the Order of Our Lady of Mount: instituted by Henry IV. of France, and incorporated with the order of the Knights of St. Lazarus of Jerusalem. The order of Mount Carmel consisted of 100 gentlemen, all French, who were to attend the king in his wars, and had considerable revenues assigned to them The order was confirmed by bull by Pope Paul V. 1607.

CARMELITE, n. *kâr'mĕl-īt:* a monk of the order of our Lady of Mount Carmel. The Carmelites were founded probably as an association of hermits on Mount Carmel by Berthold, Count of Limoges, about 1156. A legend, however, ascribes the foundation of the order to the prophet Elijah: and another makes the Virgin Mary to have been a Carmelite nun. Driven out by the Saracens in the 13th c., the Carmelites wandered over Europe; and Simon Stoch,

their general, changed them into a mendicant order 1247. From that time, they shared in the usual vices of the mendicant orders. They subsequently divided into several branches, more or less rigid in their rules, one distinguished by walking barefooted. They exist at the present day in many Rom. Cath. countries. The order of *Carmelitesses*, or *Carmelite Nuns*, was instituted 1452, and is very numerous in Italy.

CARMEN SYLVA, pen name of ELIZABETH, queen of Rumania (q.v.).

CAR'MI, Ill.: a city and county-seat of White co., 150 miles southeast of Springfield, on the Little Wabash River. It is the centre of an agricultural region and exports fruit, grain, flour, tile, and lumber. It has flouring and saw mills, brick works, machine shops, etc. Pop. (1900) 2,939.

CARMICHAEL, *kâr'mī-kal*, FREDERIC FALKINER, Irish clergyman and author: b. 1831. He was educated privately, and entering the Anglican ministry in 1857 held several church preferments in Dublin, becoming a canon of Christ Church Cathedral, Dublin, 1886; in 1880 he became professor of history in Alexandra College. He has published: *Jesus Christ, the Way, the Truth, the Life; Donellan Lectures* (1876); *The Responsibilities of God*, etc.

CARMICHAEL, MONTGOMERY: English civil servant: b. Birkenhead, England, 1857, May 17. He was educated at Bonn and Munich and entered the English consular service in 1890. In 1892 he was appointed vice-consul at Leghorn, and he has been vice-consul for West Tuscany from 1896. He is a regular contributor to the *Saturday Review*, and has published *Sketches and Stories, Grave and Gay* (1896); *In Tuscany*, a delightfully sympathetic description of Tuscan life (1901); *The Lady Poverty* (1901); *Life of John William Walshe*, a strongly conceived piece of imaginary biography (1902), etc.

CARMINATIVE, n. *kâr-mĭn'ă-tĭv* [It. *carminare*, to card wool, to make gross humors fine and thin by medicines]: a medicine, such as cardamoms, peppermint, ginger, and other stimulating aromatics, used to expel wind or to cure flatulence: ADJ. expelling wind from; warming.

CARMINE. n. *kâr'mīn* [F. and Sp. *carmin*, carmine—from Sp. *carmes*, kermes, cochineal—from Ar. *qirmizi*, crimson: It. *carminio*, carmine]: a dye of a beautiful red or crimson color bordering on purple; the coloring matter of cochineal. CARMINIC, a. *-mĭn'ĭk*, pertaining to. Carmine is obtained from cochineal, and used in the manufacture of the finer red inks, in the dyeing of silk, in coloring artificial flowers, and in miniature and water-color painting; it is the finest red color known. It was prepared first by a Franciscan monk at Pisa, who discovered it accidentally while compounding some medicine containing cochineal; and in 1656, it began to be manufactured. The finest is that which is thrown down from an aqueous infusion by chloride of tin. This, after deposit-

ing, is collected and dried. The operations require the greatest care, for the brilliancy of the color is affected by the weather, light, and temperature. The color produced by alum has a darker tint, and constitutes lake. Carmine, or carminic acid, is also the name given by chemists to the coloring matter of cochineal. The acid is a purplish body, extremely soluble in water and in alcohol. It forms salts with the heavy metals, and it yields various products when acted on by chlorine, nitric acid, and other re-agents.

CARMÖE, or KARMÖE, *kârm′ö-ĕ:* island of Norway, at the entrance of the Bukke Fiord, in the North Sea, 20 m. n.w. of Stavanger; lat. 59° 20′ n., long. 5° 15′ e.; length 22 m., average width 5 m. A strait 2 m. in width separates it from the mainland. The inhabitants are busied principally in the fisheries, and in cattle-rearing. Pop. 6,400.

CARMONA, *kâr-mō′nâ:* (ancient CARMO), a town in Spain, 20 miles from Seville, on a height overlooking a large plain covered with olive-trees. It is well built, containing many handsome mansions belonging to the nobility, who, though usually resident in Seville, spend part of the year here. The principal square is well planned, and, among other edifices, possesses a handsome Gothic church with a lofty spire. Another conspicuous object is a Moorish castle, flanked with massive towers, and there are two old Roman gates. The manufactures are chiefly woolen hats, leather, and earthenware. Recent important excavations on the site of the ancient necropolis, to the west of the modern town, have brought to light a large number of tombs and funeral triclinia in almost perfect preservation. Considerable portions of the Moorish wall and Alcazar still remain. Pop. (1903) 18,000.

CARNAC, *kâr-nâk′:* village in the dept. of Morbihan, France, 20 m. s.e. of Lorient. It is notable for the great stone monument about three-quarters of a mile from the village, on a wide desolate plain near the sea-shore. The monument consists of 1,000 or more rude broken obelisks of granite, resting with their smaller ends in the ground, rising, many of them, to a height of 18 ft., though a large proportion does not exceed 3 feet, and arranged in 11 parallel rows, forming 10 avenues, extending from e. to w., and having at one end a curved row of 18 stones, the extremities of which touch the outer horizontal rows. The origin and object of the monument remain a mystery; whether they are Celtic or pre-Celtic in date, and whether designed for religious uses or for celebration of a military exploit. There is also a large dolmen and a cairn of loose stones here. Similar but smaller structures are found to the w. of Carnac, at Erdeven and St. Barbe.—Pop. 3,000. See Lubbock's *Prehistoric Times;* Miln's *Excavations at Carnac* (1881).

CARNAGE, n. *kâr′nāj* [F. *carnage,* flesh time, slaughter

—from Mid. L. *carnăticum*, a tax paid in animals or their flesh—from L. *carnem*, flesh]: great destruction of life by violence—literally, heaps of flesh, as in slaughter-houses; havoc; massacre.—SYN.: slaughter; massacre; butchery.

CARNAHUBA PALM, *kâr-na-ô'ba*, or CARANAIBA PALM (*Copernicia cerifera*): very beautiful species of palm, which abounds in the n. of Brazil, in some places forming vast forests. It attains a height of only 20 to 40 ft.; but its timber is valuable, and is imported into Britain for veneering. The fruit is black, and about the size of an olive; it is sweet and is eaten. Scales of wax cover the under side of the leaves, and drop off when the fallen and withered leaves are shaken. This wax is melted into masses; and bees' wax is often adulterated with it.

CARNAL, a. *kâr'năl*: fleshly; sensual; opposed to spiritual, as *carnal* pleasure; unregenerate. CAR'NALIST, n. one who. CAR'NALLY, ad. *-lĭ*. CARNAL-MINDED, a. worldly-minded. CARNAL-MINDEDNESS, n. CAR'NALISM, n. *-ĭzm*, or CARNAL'ITY, n. *-năl'ĭ-tĭ*, grossness of mind or desire. CARNEOUS, a. *kâr'nē-ŭs*, like flesh; fleshy.

CARNALL, RUDOLPH VON, German mining engineer: b. Glatz, 1804; d. 1874. He began the study of mining in Berlin in 1823, was connected with the mining industry in Upper Silesia and rose to be superintendent of mines and director of the general mining office in Breslau. He took part in founding the German Geological Society, lectured at the University of Berlin on the science of mining engineering, and rendered important service to the development of German mining.

CARNALLITE, n. *kâr'năl-īt*, a hydrous chloride of potassium and magnesium, found at Stassfurt, Prussia, and of great commercial importance as being one of the minerals from which come the world's supply of potash salts. See POTASSIUM.

CARNARIA, *kâr-nā'rĭa*, or *kâr-nār'ĭ-a* [L. *caro, carnis*, flesh]: an order of mammalia in Cuvier's classification: see MARSUPIALIA: CHEIROPTERA: INSECTIVORA: CARNIVORA—all four formerly, and now usually the last three, being included in Carnaria, or Feræ.

CARNARVON, *kâr-nâr'vŏn*, HENRY HOWARD MOLYNEUX (4th EARL OF), English statesman: b. London, 1831, June 24; d. 1890, June 28. He succeeded his father in the earldom in 1849, and was secretary of state for the colonies, 1866, June, to 1867, March. During his secretaryship he devised a scheme for the federation of the British North American Colonies, subsequently approved by Parliament. He was again colonial secretary, 1874–8, and lord-lieutenant of Ireland, 1885–6. He published *The Druses of Mount Lebanon* (1860).

CARNATIC, *kâr-năt'ĭk:* region on the e. or Coromandel coast of India, extending inland to the Eastern Ghauts, and lengthwise from Cape Comorin to 16° n. (The name *Karnataka* was originally applied by its Mohammedan con-

querors to Mysore and the country *above* the Ghauts.) The C. is no longer an administrative division, but is memorable as the theatre of the struggle of last century between France and England for supremacy in India.

CARNATION, n. *kar-nā′shŭn* [F. *carnation*—from L. *caro* or *carnem*, flesh]: flesh color; a plant so called from the color of its flower—said also to be a mere corruption of *coronal* from its use in chaplets; the *Dian′thus caryŏphyl′lus*, and its numerous varieties, ord. *Căryŏphyllācĕæ*. CARNA′TIONED, a. *-shŭnd*, colored like the carnation. The carnation is one of the finest of florists' flowers, a double-flowering variety of the Clove Pink (see PINK), and existing only in a state of cultivation. The stem is about three ft. high, and generally needs support. The taller *Tree Carnations* are not esteemed by florists. The flowers are often three inches or more in diameter. Scarlet, purple, and pink are the prevailing colors; but whatever are the colors of a C., it is of no value in the eyes of a florist, unless they are perfectly distinct. Fullness and perfect regularity also are deemed essential. The varieties are extremely numerous: those which have only two colors, disposed in large stripes through the petals, are called *Flake Carnations;* those which have three shades of color, also in stripes, *Bizarre Carnations;* and those which have the flowers spotted with different colors, and the petals serrated or fringed, receive the name of *Picotees*. Carnations are propagated in summer either by layers or by *pipings*, which are short cuttings of shoots that have not yet flowered, each having two joints.

CARNEADES, *kâr-nē′a-dēz:* B.C. 213–129; b. Cyrene, Africa: Greek philosopher. He studied logic at Athens, under Diogenes, but became a partisan of the Academy and an enemy of the stoics, whose stern and almost dogmatic ethics did not suit his skeptical predilections. He was in fact one of the most important of the ancient skeptics, and held that no criterion of truth exists in man. He was founder of the Third or New Academy. In B.C. 155, with Diogenes and Critolaus, he was sent as ambassador to Rome, where he delivered two orations on justice, in the first of which he eulogized the virtue, and in the second proved that it did not exist. Honest Cato, who had no relish for intellectual jugglery, and thought it a knavish excellence at the best, moved the senate to send the philosopher home to his school, lest the Roman youth should be demoralized. Carneades died at Athens.

CARNEGIE, *kâr-nā′gĭ*, ANDREW: manufacturer: b. Dunfermline, Scotland, 1835, Nov. 25. He came to the United States with his parents 1845; settled in Pittsburg, and found employment first in running a small steam-engine; became a messenger in a telegraph office and afterward one of the first operators to read by sound; entered the service of the Pennsylvania railroad co. as telegraph operator, and planned the system of running trains more rapidly and safely by means of the telegraph; was soon promoted to be chief telegraph operator of the road and

CARNATION.

supt. of the w. div.; attracted the favorable attention of Thomas Scott and Edgar Thomson, with whom he joined in buying the Storey farm, on Oil Creek, for $40,000, which yielded in one year more than $1,000,000 in profits. He then joined the inventor of the Woodruff sleeping car in perfecting it and securing its adoption; and with others established at Pittsburg a rolling-mill, which has become the most extensive system of iron and steel industries in the world. His business interests also include the ownership of a large number of daily and weekly newspapers published in England in support of the radical party. He has accumulated a large fortune, from which he has given liberally to benevolent and educational enterprises. His benefactions include $25,000 for public swimming baths and $40,000 (afterward increased) for a free public library, in Dunfermline; $50,000 for a histological laboratory in Bellevue Hospital Medical College, New York; $1,000,000 for public libraries at Homestead, Braddock and Duquesne; $1,000,000 for one at St. Louis; one each for San Francisco and Detroit, to cost $750,000 apiece; $500,000 to Pittsburg for a public library; and $250,000 to Allegheny City for a music hall and library. In 1900 his gifts were mostly for public libraries and educational institutions, which included $10,000,000 to the U. S. Government to establish a National University to promote higher education in Washington, D. C., and incorporated in 1902 as the Carnegie Institution; $10,000,000 to Pittsburg for a technical school, with a promised total endowment of $25,000,000; $5,200,000 to Greater New York to establish 65 branch libraries; $1,500,000 to the city of Philadelphia toward the extension of its free library system; $5,000,000 to Carnegie Institute at Pittsburg and also a pledge to erect an East End branch library to cost $150,000; and $10,000,000 to Scotland for educational purposes. Other gifts include $4,000,000 to endow a fund for superannuated and disabled employees of the Carnegie Company; $1,500,000 for a Temple of Peace (building and library) for the Permanent Court of Arbitration at The Hague; $600,000 for the Tuskegee Normal and Industrial Institute in Alabama; and $1,000,000 for the erection of a building in New York City for the various organizations of engineers. In 1905 he established the Carnegie Foundation of $10,000,000, the revenue of which is to provide retiring pensions for the teachers of non-sectarian colleges, universities and technical schools in the U. S., Canada, and Newfoundland. He has also won fame as an author, his principal works being: *Notes of a Trip Around the World* (1879); *Our Coaching Trip* (1882); *An American Four-in-Hand in Britain* (1883); *Round the World* (1884); *Triumphant Democracy* (1886); *The Gospel of Wealth* (1900); *The Empire of Business* (1902); and *James Watt* (1904).

CARNEGIE INSTITUTION, an institution founded at Washington D. C. by Andrew Carnegie in 1902, Jan. 4, by a gift of $10,000,000, which, with the co-operation

of other institutions, shall in the broadest and most liberal manner encourage investigation and discovery, show the application of knowledge to the improvement of mankind, provide such buildings, laboratories, books, and apparatus, as may be needed, and afford instruction of an advanced character to students properly qualified to profit thereby. To this end Mr. Carnegie gave his endowment into the hands of a body of twenty-seven trustees, selected by himself, including among them the President and some other officers of the United States as members ex-officio. These trustees were incorporated 1902, Jan. 4, and organized the Institution Jan. 29, choosing the following officers:

President, Daniel C. Gilman; Chairman of Trustees, Abram S. Hewitt; Vice-Chairman, John S. Billings; Secretary, Charles D. Walcott, and an Executive Committee including the persons named and S. Weir Mitchell, Elihu Root, and Carroll D. Wright. All these officers were among the trustees named by the founder, who were authorized to elect their successors. In 1905 Robert S. Woodward (q.v.) became president.

The Institution established an office in Washington, D. C., and sent out a circular statement of its object to different institutions of learning Its aim was declared to be:

(1) To promote original research.

(2) To discover exceptional men for particular investigations, and to encourage them to make research a life work.

(3) To increase facilities for higher education.

(4) To increase the efficiency of universities by adding to their facilities, and aiding teachers.

(5) To enable students to utilize the museums and collected advantages of Washington.

(6) To insure prompt publication of helpful results attained.

It was declared that the Institution had power:

(a) To hold and convey real estate and funds.

(b) To conduct, endow, and assist investigation, cooperating with governments, universities, societies, etc.

(c) To appoint committees of experts for special research.

(d) To publish and distribute documents.

(e) To conduct lectures.

(f) To hold meetings.

(g) To acquire and maintain a library.

(h) To do all things necessary to its objects.

CARNEY, n. *kâr'nĭ* [L. *carnōsus*, fleshy—from *carnem*, flesh]: a disease among horses, in which the mouth is so furred that they cannot eat; sometimes follows a sudden change from green to dry food. Heavy feeding with grain, with irregular or insufficient exercise, is also an exciting cause. Treatment: place the horse in a well-ventilated stable, feed warm bran mashes, and give flaxseed tea.

CARNEY, n. *kâr′nĭ* [prov. and slang, comp. Gael. *carnadh*, to pile up stones on a cairn, hence to pile up flatteries]: in *prov. Eng.*, soft hypocritical talk: V. to wheedle; to insinuate one's self by flattery. CAR′NEYING, imp.: ADJ. wheedling; fawning. CAR′NEYED, pp. *-nĭd.*

CARNIFAX FERRY, *kâr′nĭ-fâks fĕr′rĭ*, BATTLE OF: in Nicholas co., Va., on the Gauley river, 8 m. below Summerville, 5,000 Confederates under Gen. Floyd, entrenched on the n. bank, were attacked by a larger force under Gen. Rosecrans, 1861, Sep. 10. The action was ended by darkness, and in the night Floyd escaped, destroying his bridge behind him, leaving his equipage and munitions.

CARNIFY, v. [L. *carnem*, flesh, *fio*, become]: to form flesh; to become fleshy. *Cărnĭfĭcā′tion*, a turning into or forming flesh.

CARNIOLA, *kâr-nĭ-ō′la* (Ger. *Krain*): a crown-land of the Austrian empire, 3,856 sq. m.; pop. (1900) 508,150, of whom 32,000 are Germans, 17,000 Croats, the rest being Slavs of the Slovenian branch. A continuation of the Carinthian Alps passes through it in the n., and the Julian Alps in the s. The scenery of the country abounds in interesting and singular features, among which one of the most notable is the rock-bridge of St. Kanzian, 130 ft. high, and 160 ft. broad, with a perfect arch 62 ft. high, and 154 ft. long. The Save (q.v.) is the principal river. The singular lake of Zirknitz (q.v.) is in Carniola. The climate of C. is in general mild, except in the high mountainous parts. The country does not produce corn or cattle enough to supply the wants of its inhabitants, and millet, pulse, and wild-fruits are principal articles of food of many. Some districts yield excellent wines and much fine fruit. Flax, silk, maize, and honey are produced. The chief minerals are iron, quicksilver, and brown coal; the quicksilver mines of Idria are among the most important in Europe. Linen-weaving and the manufacture of a coarse lace are practiced. Laibach is the capital.

C. received its present name after the settlement here of the Slavonic Wends or Slovenians. Charlemagne conquered it. From 972 it had markgraves of its own. Part of the territory passed to the dukes of Austria in the 13th c., and the remainder was acquired by them in the 14th. After the treaty of Vienna, in 1809, it was ceded to France, and incorporated in the kingdom of Illyria. In 1814 it came again into the possession of Austria.

CARNIVAL, n. *kâr′nĭ-văl* [F. *carnaval*—from It. *carnovale*—from L. *carnem*, flesh; *levārĕ*, to lighten; low L. *carnis levāmen*, the solace of the flesh—*lit.*, a lightness or solace of the flesh]: festival which originally began on the feast of the Epiphany, and continued to Ash-Wednesday, when the fast of Lent made an end of the preceding feasting, masquerading, and buffoonery; shrovetide; time of luxury. *Note.*—The popular etymology from It. *carnĕ*, flesh, and *vălĕ*, farewell, arose from a simple

mistake in an accommodation of the spelling of the terms to the sense of the word. In later times, the C. was limited to the time of from three to eight days before Ash-Wednesday. Without doubt, the forms and customs still preserved in the celebration of the C. originated in the heathen festivals of spring-time; and they still recall partly the Lupercalia and Bacchanalia of s. Europe, and partly the Yule-feast among northern peoples. Banquets of rich meats and drinking-bouts were the chief attractions of the C. during the middle ages. Shrovetide (q.v.), or Shrove-Tuesday, called also Fasten-Even or Pancake-Tuesday, was a relic of the English C., and formerly a season of extraordinary sport and feasting. The rich commenced the festive time at the feast of Epiphany, or on 'Three Kings' Day;' but the middle classes restricted their days of revelry to the week immediately preceding Lent; while the poor indulged in only a few days of mad mirth. The several chief days of C. had distinct names, such as 'fat' or 'greasy Sunday,' 'blue Monday' (or 'fool's consecration'), etc. The Tuesday before the beginning of Lent was especially styled C.—the *Fastnacht* of the German people. In most countries, especially where Protestantism prevails, the celebration is confined to wearing of masks, processions in costume, and masked balls. But in Italy, especially the cities, it is still a popular festival of universal observance. Venice used to be pre-eminent for the splendor of its observances; the C. of Rome is now the best known, though Milan and Naples vie with it. At Rome, races of riderless horses along the crowded Corso are one of the chief items in its celebration; as also the throwing of plaster confections from the windows and balconies on the occupants of the carriages and processional cars, and a return fire from below. In Germany the C. is observed not merely in Rom. Cath. towns like Munich and Cologne, but in Leipzig, Hamburg, and Berlin.

CARNIVORA, n. plu. *kär-nĭv'ō-rä* [L. *carnĭvŏrus*, feeding on flesh—from *carnem*, flesh; *voro*, I eat greedily]: flesh-eating animals. CARNIV'ORAC'ITY, n. *-răs'ĭ-tĭ*, greediness for flesh. CARNIV'OROUS, a. *-ō-rŭs*, feeding on flesh.

CARNIV'ORA: a great order of Mammalia (q.v.), naturally separated into two divisions: (1) the *Fissipedia*, including all the land carnivores, and (2) the *Pinnipedia*, or aquatic forms. The former exhibit marked affinities to the Insectivora and even to the Marsupialia, while the more highly specialized Pinnipedes lead directly toward that extreme modification of the carnivorous type which we find in the Cetacea.

The fissipede carnivores have the usual number of incisor teeth—six in each jaw. The digits are free and provided with powerful claws, and the terminal phalanx which bears the claw is retracted upon the middle phalanx by an elastic ligament when the flexor muscle of the digits is not in action, and the claw is thus protected from wear in walking. This arrangement is best developed in the most finely carnivorous forms—the feline alliance. The cerebral hemispheres are

long and well convoluted, and the olfactory lobes are large. The bones are comparatively slender, yet of great strength and extremely close texture, while the skull is characterized not merely by its density, but by the great shortening of the jaws, the transverse elongation and narrowing of the condyles to admit only of an up and down cutting movement, as well as by the development of large bony ridges upon the top and sides of the skull for the attachment of the enormous jaw muscles. The teeth, too, are more or less completely modified for cutting and mincing the flesh of their victims, and the higher carnivores are thus very strongly contrasted with the herbivores, whose long weak jaws and ridged teeth are as completely adapted for the slow and prolonged grinding of their less nutritious food. The stomach is always simple, and the alimentary canal is short—sometimes, as in the lion, not more than three times the length of the body, while that of vegetable feeders may vary from 12 to 30 times their own length. The body is thus comparatively light and slender, an advantage of great importance in chasing or springing upon prey.

The most familiar carnivores, the dog, bear, and cat, may conveniently be taken as types of the three great sections of land carnivores—the *Cynoidea*, *Arctoidea*, and *Ailuroidea*—which are distinguished by numerous important characters, chiefly of osteological detail. The Cynoidea include the species of *Canis* (dog, wolf, jackal, fox, etc., q.v.), together with a few aberrant forms, such as the long-eared fox (*Megalotis*) and hyena-dog (*Lycaon*) of s. Africa, and are undoubtedly the least differentiated group. They are all digitigrade, and possess an almost typical dental formula; though only two upper molars above three lower are present. The Ailuroidea include five families; (1) *Viverridæ* (civet, ichneumon, etc., q.v.); (2) *Protelidæ*, including only the aard-wolf (*Proteles*), intermediate between civets and hyænas; (3) *Cryptoproctidæ*, also monotypic, including only the *Cryptoprocta* of Madagascar, intermediate between civets and cats; (4) *Hyænidæ* (Hyena, q.v.); and (5) *Felidæ* (cat, lion, tiger, leopard, puma, lynx, cheetah, etc., q.v.). These are considerably specialized above the canine type, being mostly digitigrade, with full retractile claws, having the molar series more and more reduced, so that in the cats and hyenas only one remains above and below; and the last upper premolar and first lower molar always forming the *Carnassial* teeth, which cut like powerful scissors. The Arctoidea contain three important families: (1) *Ursidæ*, including the numerous species of bears (q.v.); (2) *Procyonidæ* the racoon, kinkajou, etc., (q.v.); and (3) the vast and heterogeneous group of *Mustelidæ*, including the marten and sable (*Mustela*), the weasel, ermine, polecat and ferret (*Putorius*), as well as the ratel, glutton, badger, otter, and sea-otter (q.v.). The Arctoidea are plantigrade, their skulls comparatively long, and their teeth more or less tuberculated, some of the bears being

indeed almost completely herbivorous. The otter and sea-otter (*Enhydris*) exhibit a most distinct transition to the seals, the habit being aquatic and the feet webbed; while in the latter genus the hind feet are permanently directed backward, the base of the skull too thin, and the dentition reduced.

The palæontology of the Carnivora is of the greatest interest, for not only do the three great families run back to such perfectly intermediate and apparently ancestral forms as the eocene 'bear-dog,' *Arctocyon*, but many genera occur which not only break through the divisions between the existing families, but link these closely to the marsupials.

The *Pinnipedia* are divided into three families—the *Otaridæ*, eared seals or sea-lions (*Otaria*); the *Trichechidæ*, including only the walrus (*Trichechus*); and the *Phocidæ*, or true seals (*Phoca*, etc.).

See Huxley, *Comp. Anat. of Verteb. Anim.*, and Cassell's *Natural History*, vol. ii.

CARNIVOROUS PLANTS: see DIONÆA: SUNDEW.

CARNOCHAN, *kâr'nŏk-ėn*, JOHN MURRAY, M.D., 1817–87, Oct. 28; b. Savannah, of a Scotch father and a mother descended from Gen. Putnam. He studied in Paris, London, and Edinburgh, and began to practice 1847 in New York, where he rapidly rose to eminence, and became prof. of surgery in the N. Y. Medical College, 1851–63. A number of his operations marked new departures in surgery. He amputated the entire lower jaw, 1852, and cured *elephantiasis arabum* by tying the femoral artery. He exsected the entire radius 1853, the entire ulna 1854, and the entire trunk of the second branch of the fifth pair of nerves, 1856, to cure neuralgia. He repeatedly amputated at the hip joint. Carnochan published a *Treatise on Congenital Dislocations* (1850), *Contributions to Operative Surgery*, and other works, besides translating Sedillot's *Operative Medicine* and Rokitansky's *Pathological Anatomy*. He died of apoplexy in New York.

CARNOT, *kâr'no*, LAZARE HIPPOLYTE: 1801, Apr. 6—1888; b. St. Omer: one of the leaders of the French democracy. In early life a disciple of St. Simon, he, like others, left that school on account of the lax morals advocated by Enfantin—protesting against 'the organization of adultery'—and devoted himself to the inculcation of a more orthodox and virtuous socialism in various periodicals. In 1847, he declared himself a republican in his brochure, *Les Radicaux et la Charte;* and, after the February revolution, was appointed minister of public instruction, but soon resigned. In 1863, he entered the corps législatif and the national assembly 1871. He was elected a senator for life 1875. He wrote *Exposé* of St. Simonianism and *Mémoires* of Henri Gregoire and of Barère. His son is (1888, March) president of the French republic.

CARNOT, *kâr-no'*, LAZARE NICOLAS MARGUERITE: 1753, May 13—1823, Aug. 2; b. Burgundy: milit. engineer.

In 1791, he became a member of the assembly, and voted for the death of Louis XVI. After gaining the victory of Wattignies, he was intrusted with the chief direction of milit. affairs. In 1797, having opposed Barras, Carnot was sentenced to deportation, but escaped into Germany. Returning to Paris, he became minister of war, 1800. In 1814, he took command of Antwerp, which he heroically defended. During the Hundred Days, he held office as minister of the interior; and after the second restoration, retired first to Warsaw, and next to Madgeburg, where he died.

CARNOT, Marie François Sadi: statesman: b. Limoges, France, 1837, Aug. 11; son of Lazare Hippolyte C., and grandson of Lazare Nicolas Marguerite C. He was educated for a civil engineer in the Polytechnic School and the School of Bridges and Roads; engineer in charge at Annecy 1864–70; commissioner extraordinary to organize the national defense of the depts. of Seine-Inférièure, Eure, and Calvados 1870; prefect of the dept. of Seine-Inférièure 1871; elected member of the national assembly and sec. of the 'republican left' 1871; supported all measures for the definite establishment of a republic; and served on several influential and technical committees. In 1876 he was elected member of the chamber of deputies and its sec.; 1877 was one of 363 deputies of the 'left' re-elected; 1878 was appointed under-sec. of public works; 1880 minister of public works; 1882 minister of finance, holding the office by reappointment till 1886, Dec. 11; and 1887, Dec. 4, was elected pres. of the republic to succeed Jules Grévy (q.v.) by a vote of 616 in a total of 824. During a féte given in his honor at Lyons, he was assassinated by an Italian anarchist named Santo, 1894, June 24.

CARNOUS, n. *kâr′nŭs*, or Carnose, a. *kâr-nōs′* [L. *carnōsus*, full of flesh—from *carnem*, flesh]: in *bot.*, fleshy—applied to albumen having a fleshy consistence. Carnosity, n. *kâr-nŏs′ĭ-tĭ*, a small fleshy excrescence.

CARO, *kâ-ro′*, Elme-Marie: 1826–87, July 13; French metaphysician: member of the *Académie Française* and of the *Académie des Scienceis, Morales et Politiques*. His lectures at the Sorbonne, through 20 years, were very popular, especially among ladies of rank, who were attracted by Caro's elegant rhetoric and persuasive oratory, perhaps, also by the mystical vagueness of his discourses: hence Caro was known as 'the ladies' philosopher.' He largely followed V. Cousin, and vigorously attacked the doctrines of Schopenhauer and Hartmann. Some of his titles were: *Materialism and Science, Positivism and Contemporary Religion, Sensualism in Literature, Pessimism in the 19th Century*. Caro was one of the most brilliant writers in the *Revue deis Deux Mondes* and the *Journal des Savants*. He died in Paris.

CAROB, n. *kăr′ŏb* [F. *caroube*—from It. *carruba;* Sp. *garrobo;* Ar. *kharrub*]: also Algaroba, *ăl′ga-rō′ba*, or Lo-

CUST-TREE (*Ceratonia siliqua*): evergreen tree of the nat. ord. *Leguminosæ*, sub-order *Cæsalpinieæ;* native of the countries around the Mediterranean Sea; in size and manner of growth much resembling the apple-tree, but with abruptly pinnate dark evergreen leaves, which have about two or three pair of large oval leaflets. The flowers are destitute of corolla; the fruit is a brown leathery pod, 4–8 inches long, a little curved, and containing a fleshy and at last spongy and mealy pulp, of an agreeable sweet taste, in which lie a number of shining brown seeds, somewhat resembling small flattened beans. The seeds are bitter and of no use, but the sweet pulp renders the pods an important article of food to the poorer classes of the countries in which the tree grows. They are very much used by the Moors and Arabs. They are also valuable as food for horses, for which they are much employed in the s. of Europe, and have of late years begun to be extensively imported into Britain, under the name of *Locust Beans*, which name and that of *St. John's Bread* they have received in consequence of an ancient opinion or tradition, that they are the 'locusts' which formed the food of John the Baptist in the wilderness. It seems probable that they are the 'husks' (*keration*) of the parable of the prodigal son.—The Arabs make of the pulp of the C. a preserve like tamarinds, which is gently aperient.—It is thought that the introduction of the C. tree into the north of India would be an important addition to the resources of that country, and a valuable safeguard against famine. The produce is extremely abundant, some trees yielding as much as 800 or 900 lbs. of pods. The wood is hard, and much valued, and the bark and leaves are used for tanning.—The locust tree (q.v.) of America is quite distinct from this.

CAROL, n. *kăr'ŏl* [OF. *carole*, a dance; W. *coroli*, to dance; *carol*, a carol, a song—from *cór*, a circle; Gael. *car*, a twist, a bend; L. *corolla*, a garland, a chaplet]: properly a round dance with twisting and bending; a song of joy and exultation; a song in general: V. to praise or celebrate in song; to sing in joy; to warble. CAR'OLLING, imp. N. a song or hymn. CAR'OLLED, pp. *-ŏld.* Carol has long been applied especially to a Christmas hymn (see CHRISTMAS CAROL), and of late is associated similarly with Easter.

CAROLAN, *kăr'o-lan*, or O'CAROLAN, TURLOUGH: abt. 1670–1738, Mar. 25; b. Newton near Nobbu, co. Meath: most famous of modern Irish bards. His father was poor, and total blindness, resulting from small-pox at the age of 17, led Carolan to become an itinerant minstrel. Furnished with a harp, a horse, and an attendant, he began at 21 to make a circuit of gentlemen's houses, chiefly in Connaught, and was entertained as a friend, never playing for hire. He composed more than 200 songs, words and music, a good proportion celebrating the virtues of his benefactors; many of them are preserved among the Irish MSS. in the British Museum. Carolan's poetical Remains, with English translations,

were printed in Hardiman's *Irish Minstrelsy*, 1831. He was buried at Kulronan.

CAROLINA PINK: see SPIGELIA.

CAROLINE, *kăr'o-līn*, AMELIA ELIZABETH, Queen: wife of George IV. of Great Britain; 1768, May 17—1821, Aug. 7; second daughter of Charles William Ferdinand, Duke of Brunswick Wolfenbüttel, and of the Princess Augusta of Britain. She spent her youth under great restraint at her father's court. In 1795, she was married to the Prince of Wales. The marriage was disagreeable to him, and although she bore him a daughter, the Princess Charlotte, he separated from her immediately on her recovery from childbed, and she lived by herself in a country residence at Blackheath, the object of much sympathy, the people regarding her as the victim of her husband's love of vice. Reports to her discredit led the king, in 1808, to cause investigation to be made into her conduct, which was found to be imprudent, but not criminal. In 1814, she obtained leave to visit Brunswick, and afterward to make a further tour. She visited the coasts of the Mediterranean, and lived for some time on the lake of Como, an Italian, by name Bergami, being all the while in her company. When her husband ascended the throne, 1820, she was offered an annuity of £50,000 sterling to renounce the title of queen, and live abroad; but she refused and made a triumphal entry into London, whereupon the government instituted proceedings against her for adultery. Much that was very offensive was proved as to her conduct; but the manner in which she had been used by her husband, and the splendid defense of Brougham, caused such a general feeling in her favor that the ministry were obliged to give up the divorce bill, after it had passed the house of lords. She now fully assumed the rank of royalty, but was refused coronation, and turned away from the door of Westminster Abbey on the day of the coronation of her husband.

CAROLINE BOOKS (*Libri Carolini*, or *Opus Caroli*): answer of Charlemagne to Alcuin, censuring the Synod of Nicæa, 787, and the part of Pope Adrian I. therein. The controversy concerned image-worship: Charles was displeased with the pope and the Byzantine court, and had forwarded the acts of this synod to Offa of England, who laid them before his bishops. Alcuin, who was then in England, wrote some comments, and gave them to Charlemagne in the name of the English princes and bishops; this letter is lost, but it was the immediate or nominal occasion of the Caroline Books. Divided into four books and 120 chapters, the Caroline Books laid down a principle which at once leaves Christian art free and guards against the superstitious misuse of it as establishing doctrine and directing worship. The synods of Frankfort, 794, and Paris, 825, accepted the Caroline Books as an authority. They were first printed by Jean du Tillet, Paris, 1549.

CAROLINE ISLANDS: archipelago in the Pacific Ocean, e. of the Philippine Islands, and n. of New Guinea; from lat. 3° to 11° n., and long. 135° to 177° e. They were probably first visited by Saavedra 1528; the name was given in honor of Charles II. of Spain by Admiral Lazearo, who discovered a group 1686. They are claimed by the Spaniards, who divide them into Western, Central, and Eastern C. The Western are the Pelew Islands (q.v.). The Central C., or C. proper, consist of 400 to 500 islands, in abt. 48 groups; omitting three remote islands, all these are within an area of 20 sq. m. The Ngoli, Gulu, or Matelotas group has three islands n.e. of the Pelews, with a few inhabitants from Yap. Yap or Guam is further n. e., about 10 m. long, and has a good harbor on its s.e. side. The natives are superior to most of their neighbors, with villages regularly laid out and paved streets; they build stone piers and wharves, make good boats, and cultivate the betel-nut with care. A Spanish mission is located here. Yap is described in the *Godeffroy Journal* for 1873, as also the Ulithi, Elivi, or Mackenzie group, which had been visited and written on by Capt. Wilkes of the United States exploring expedition. The Hugolen or Rug group, discovered by Duperrey 1824, has five large and 40 smaller islands, with nearly 35,000 inhabitants of two different races, red and black, who make war on each other. The Mortlock or Young Williams group, discovered 1793, has three atolls, Satoan, Etal, and Lukunor, with 3,400 inhabitants of Samoan origin, said to be the only idolaters in these islands. Nutik or Raven Island, n.e., was discovered 1773. Puynipet or Ascension with two low atolls comprises the Seniavine group, so called by Admiral Lütke. Here are a few whites and an American mission; there were but 2,000 natives in 1858. This island is a rendezvous for whalers, and contains some curious ruins. By treaty, 1899, Feb. 12, these islands, with the exception of Guam (the largest of the Ladrone Islands), which had been ceded to the U. S. in 1898, passed from Spain to Germany, 1899, Oct. 1. The price paid by Germany was 16,750,000 marks (about $4,000,000). Pop. (1901) 142,142.

CAROLINE MATILDA, Queen of Denmark; sister of George III. of England: see STRUENSEE, JOHANN FRIEDRICH.

CAROLITIC, a. *kăr'ō-lĭt'ĭk* [L. *corolla*, a garland, a chaplet]: in *arch.*, adorned with festoons or foliage.

CAROLUS-DURAN, EMILE AUGUSTE: 1837, July 4 Lille, France, eminent French painter. He studied in Paris (1853–61); in 1861, went to Rome, and later to Spain. *L'Assassine* (1866) procured him his first medal. In 1878, he exhibited his design, *Gloria Marie Medicis*, for a ceiling in the Luxembourg. *The Evening Prayer* was painted in 1863. He is famed for portraits of great faithfulness and power. Among them are those of the Countess of Warwick and the Duchess of Marlborough. His wife (née Croizette) is famous for pastel-work.

CAROM, n. *kăr'ŭm* [Fr. *carambole*]: in billiard play, the impulsion of two balls successively by the ball from the cue; the stroke which has this effect.

CAROTID ARTERY, *ka-rot'id:* the great artery of the neck which on each side distributes blood to the different parts of the head, appears to have derived its name either from Gr. *kara*, the head, or, more probably, from Gr. *karos*, sleep, there being an old idea, which the researches of Dr. Alexander Fleming have shown to be correct, that there was some connection between deep sleep and compression of these vessels.

Each C. A. consists of the primitive or common carotid, which, at the upper margin of the larynx or organ of voice, separates into two great divisions, of nearly equal size—the external and the internal carotid. The external carotid supplies the larynx, tongue, face, and scalp with blood, its principal branches being the superior thyroid, the lingual, the facial, the occipital, the posterior aural, the internal maxillary, and the temporal. The last-named artery is occasionally opened by the surgeon in preference to a vein, as, for example, in certain cases of cerebral apoplexy. The internal carotid enters the cavity of the cranium through a somewhat tortuous canal in the temporal bone, and after perforating the dura mater, or fibrous membrane of the brain, separates into the anterior and middle cerebral arteries, which are the principal arteries of the brain; while in its course through the dura mater, it gives off the ophthalmic artery, which subdivides into several small branches that supply the eye and surrounding parts. See CIRCULATION.

Surgery.—Wounds of the carotid trunks are generally from stabs. Suicides have a vague desire to cut them, but rarely cut sufficiently deep by the side of the windpipe. Of course, should either vessel be wounded, death results almost immediately. Punctured wounds, however, may not be immediately fatal; they may heal, or a false aneurism (q,v.) may result.

Sir Astley Cooper was the first to tie the common carotid for spontaneous aneurism, in 1805, Nov.; and the operation has been successfully performed in a number of cases since. Owing to the numerous interchange of branches between vessels of both sides of the head, cutting off the supply of blood through one carotid is seldom followed by affections of the brain. Such have, however, occurred in a few instances; but Dr. Mussey, of America, tied both carotids within twelve days of each other without any such result.

The common carotid in the horse is the termination of the right arteria innominata. It is a large vessel, about an inch long, which emerges from the chest below the windpipe, and divides into the *right* and *left* carotids. These bend upward, having the windpipe between them, gradually inclining inward at the upper part, where each divides into external and internal carotid, and a large anastomosing branch arising from between these two.

CAROUSE, v. *kă-rowz'* [Ger. *gar aus*, all out: Sp. *car-auz* or *caraos*, act of drinking a full bumper to one's health]: to drink hard; to revel: N. a drinking-match; a revel. CAROUSING, imp. *kă-row'zing*. CAROUSED', pp. *-rowzd'*. CAROU'SER, n. *-zĕr*, one who. CAROU'SINGLY, ad. *-lĭ*. CAROU'SAL, n. *-zăl* [F. *carrousel*, a tilt, a carousal]: a feast or banquet; revelry. *Note.*—In F. the *carrousel*—from It. *carosello* or *garosello*, was the tilt or tournament, and the amusements and revelries connected therewith, and seems to have been adopted into English in the sense of 'feasting and revelries' only; *carouse*, as may be seen from the text, is really from a different root: comp. Gael. *craos*, a large mouth, *craosach*, deep-drinking.

CARP, v. *kârp* [Icel. *karpa*, to boast: prov. Sw. *karpa*, to brag: L. *carpĕrĕ*, to pluck: Port. *carpire*, to cry or weep]: to snatch or catch at; to find fault, generally without sufficient reason; to cavil; to censure—followed by *at*. CARP'ING, imp. CARPED, pp. *kărpt*. CARP'INGLY, ad. *-lĭ*. CARP'ER, n. one who.

CARP, n. *karp* [F. *carpe*, a carp—from mid. L. *carpa*; Ger. *karpfen*; Dut. *karper*; Icel. *karfi*], (*Cyprinus carpio*): fish of the family *Cyprinidæ* (q.v.), of which, indeed, it may be regarded as the type; native of central Europe, and corresponding latitudes in Asia, but on account of its value as an article of food, long naturalized in many countries in which it is not indigenous. No fish, indeed, except its congener the goldfish, has been so much transported by man from one place to another; and this has been the more easily and successfully accomplished, that the C. can subsist longer than most fishes out of the water,

Carp (*Cyprinus carpio*).

if only kept moist. The C. is said not to be originally a native of England, but the statements sometimes made as to the time of its introduction are untrustworthy; it certainly existed in England before the 16th c. It is mentioned in the famous Boke of St. Albans, 1496, by Dame Juliana Barnes, as a 'dayntous fysshe, but scarce.' The C. spawns in May, and is out of condition until July. It does not thrive so well in Scotland, of which country it is certainly not a native, as in the south of England; and in northern countries generally, it neither increases so rapidly in size, nor has so great fecundity, as in more congenial climates. Its fecundity, in favorable circumstances, is prodigious; more than 700,000 eggs have been found in the ovaries of a single C. of moderate size. The C. is an in-

habitant of lakes and ponds rather than of rivers, in which, if it is found, it shows a preference for the stillest parts. It feeds chiefly on aquatic plants, and may be fattened on lettuces and similar soft vegetables, for which its teeth are remarkably adapted, being few, mostly large, flat, and situated on the pharynx very far back in the mouth; worms, mollusks, and insects, however, form part of its food. It deposits its spawn on weeds. It is said to live to a great age, even 150 or 200 years, its scales, 'like the productions of the cuticle in some other animals, becoming gray and white with age.' It is known to attain the weight of 3 lbs. when six years old. A C. of 18 or 19 lbs. weight is deemed of extraordinary size in England, but one of 70 lbs. weight, and nearly 9 ft. long, was taken near Frankfort-on-the Oder, and 30 or 40 lbs. is not an unusual size in some of the German lakes. In Austria and Prussia, many lakes and ponds are let at a high rent for the C. which they contain —Of the other species of the genus *Cyprinus*, as now restricted, which are found in Britain, none belong to the section having barbules at the angles of the mouth. See CRUCIAN: GIBEL: GOLDFISH.

To the angler, the C. is not a very valuable fish, as it is by no means a free biter. When hooked, however, the C. runs strongly, and fights with considerable determination and cunning. In still water, the best means of fishing for C. is with a very light quill-float. A small piece of dead rush will answer the purpose equally well, or better. The float should be fixed on the line so that the bait may be *upon* the bottom, and if that be clear of weeds (the angler must select with this in view), the C. will easily see and pick up the bait. It is advisable, however, in fishing for C., to use two rods, and the float to one of these should be so placed that the bait may be just *off* the bottom. The former tackle should be baited with well-scoured red worms, gentles, or grubs of some sort; the latter with a green pea, boiled wheat, or paste. Gentles, wasp grubs, flies, and other insects, worms, or caterpillars, may all, at times, take carp. When a C. bites it nibbles at the bait for some seconds before taking it, and often takes off the tail of the worm, or strips the hook completely. But it is useless to strike until the float disappears entirely.

CARPACCIO, *kâr-pât'cho*, VITTORE: one of the most notable painters of the early Venetian school, whose work dates from the end of the 15th c. and the beginning of the 16th. He was a pupil and rival of the two Bellinis (q.v.). He had rich invention, and great power of dramatically representing action; his work is marked more by grace and harmony than by richness of color. He frequently painted subjects in series; thus there are eight pictures illustrating the life of St. Ursula (all at Venice), and five on the history of St. Stephen (at Milan, Paris, and Berlin). He was industrious and successful in his art till 1515, when his powers declined. John Ruskin has sought to awaken interest in C.'s art.

CARPAL: see under CARPUS.

CARPATHIAN MOUNTAINS, *kâr-pā'thĭ-an:* mountains which inclose Hungary and Transylvania on the n., e., and s. in a great semicircle, extending 800 m. from Presburg on the Danube to Orsova on the same river. The Carpathian Mountains form part of the great mountain system of central Europe, separated from the mountains of Silesia and Moravia by the valley of the March, and from the Alps and Mount Hæmus by the valley of the Danube. Almost the whole of the Carpathian Mountains lie within the Austrian dominions. They form two great masses, one in Hungary to the n.w., and one in Transylvania to the s.e., with ranges of lower and wooded mountains between. The highest group of the Hungarian Carpathians is that of *Tatra* or the *Carpat*, in the very n. of Hungary, a majestic mass of granite mountains, exhibiting much grandeur in its naked precipices, and in some of its peaks rising to the height of more than 8,000 ft., the Lomnitz peak being 8,133 ft. high. On the n. declivity of the Eisthal peak is the only glacier in the Carpathians. The Tatra group is penetrated by no valleys, but only by wild ravines, and is separated from the rest of the range by deep depressions. There is a great difference of climate between its s. and n. sides. These higher mountains yield few minerals, but the lower Carpathians of Hungary, which stretch around them in groups and ranges, abound in minerals of various kinds. The mines of Schemnitz (q.v.) are of great celebrity. Many of the Hungarian mountains are of limestone. The mountains of Transylvania are mostly of primitive rocks. On the e. and s. borders, they reach the height of 9,000 ft. and upward. Mount Butschetje, the culminating peak, has an elevation of 9,528 ft. above the sea. The Carpathian Mountains are generally clothed with wood to a height of more than 4,000 ft.—in some parts forests are found at 5,500 ft.—and with steep precipices, narrow ravines, extinct craters, and cones of volcanic origin, they exhibit scenes of grandeur rarely exceeded. The lower parts of the mountains are beautifully clothed with vineyards, walnut groves, etc., above which ascend forests of cherry, beech, and pine. The ranges which connect the high mountains of Hungary with those of Transylvania are in great part composed of sandstone, have an unfruitful soil, and comparatively little population or cultivation.

CARPATHOS: see SCARPANTO.

CARPEAUX, *kâr-pō'*, JEAN BAPTISTE: 1827, May 14—1875, Oct. 23; b. Valenciennes; sculptor. He studied in Paris, and gained the prize of Rome 1854; his first notable statue, a fisher boy, was produced in 1859. The group of Ugolino and his children was purchased by the French govt. 1863, and drew attention by its bold departure from classical models. He designed for the Louvre, 1865, figures showing the French empire enlightening the world and protecting agriculture and science. His work *La Danse*, on the façade of the new opera house, 1869, was much praised and equally blamed; soon after it appeared an attempt was made, Aug. 27, to injure it with corrosive

ink. Among his other chief works are a Neapolitan fisherman, in Baron Rothschild's College, and a girl with a shell, owned by the Duchess de Mouchy. Carpeaux was a leading representative of the naturalistic school.

CARPEL, n. *kâr'pĕl* [Gr. *karpos*, fruit]: in *botany*, a modified leaf forming the whole or part of the pistil of a flower. The number of ovaries and stigmas in the pistil depends on the number of carpels of which it is composed, but sometimes several are so intimately united that they appear as one. It is the upper surface of the leaf which forms the inner surface of the carpel. At its margins, the ovules are developed, like the buds formed on true leaves of some kinds of plants. The fruit, as well as the pistil, may therefore be said to be composed of one or more carpels. CARPELLARY, a. *-pĕl'lėr-ĭ*, pertaining to a carpel.

CARPENTARIA, *kâr-pĕn-tâ'ri-a*, GULF OF: broad and deep indentation of the n. coast of Australia, stretching from 11° to 17° 30′ s. lat. and from 136° to 142° e. long. It is said to have been named from Carpenter, a Dutchman, who discovered and partly explored it 1627. The Gulf of Carpentaria contains many islands. The shores of the mainland are generally low; and, in the rainy season, the floods are such as materially to freshen the sea.

CARPENTER, n. *kâr'pĕn-tėr* [OF. *carpentier;* F. *charpentier*, a worker in timber—from L. *carpentārĭŭs*, pertaining to a chariot, a wheelwright—from *carpen'tum*, a carriage, a chariot: comp. Gael. *carbh*, a plank, a ship]: a man who works in timber; a builder or framer in wood, as in houses and ships; a wright. SHIP'S CARPENTER, in the navy, one whose duty is to keep a ship of war in repair, specially during a battle, in case of damage that might endanger sinking. CAR'PENTRY, n. *-trĭ*, the art of framing and joining timber in the construction of buildings. CARPENTER'S-RULE, the instrument by which carpenters take their dimensions, and by the aid of a brass slide, which makes it a sliding-rule, they are enabled to make calculations in multiplication and division, beside other operations. CARPENTER'S-SQUARE, an instrument whose stock and blade consists of an iron plate of one piece. The larger leg is eighteen inches long, and numbered on the outer edge from the exterior angle with the lower part of the figures adjacent to the interior edge. The other leg, which is 12 inches long, is numbered from the extremity toward the angle, the figures being read from the internal angle as on the other side. This instrument is used not only as a square, but also as a level and measuring rule. *Note.*—A *carpenter* means properly one who does the larger and coarser work, and the *joiner* the finer.

CARPENTER, CHARLES CARROLL: an American naval officer; 1834, Feb. 27—1899, April 1; b. in Greenfield, Mass.; was promoted commodore 1893, rear-admiral 1894. He was commander-in-chief of the U. S. Asiatic Squadron 1894–95; rendered valuable service in China during the summer of 1895 in protecting the American

missionaries and in co-operating with U. S. Minister Charles Denby and the British and Chinese authorities to preserve peace.

CARPENTER, Cyrus C., American soldier and politician: b. Susquehanna County, Pa., 1829; d. Fort Dodge, Iowa, 1898, May. 29. Having been left at the age of 10 years a penniless orphan, he was apprenticed to a tailor, in the meantime gaining a limited education in the district school. In 1854 he went to Fort Dodge, Iowa, as a government surveyor; then became successively principal of the first school established in Fort Dodge, government land agent, and in 1858 a member of the state legislature. Upon the outbreak of the Civil War he entered the army in the commissary department, serving for two years on the staff of General Dodge and for one year with General Logan, and was mustered out after having attained the rank of lieutenant-colonel. He was twice elected register of the State Land Office, in 1866 and 1868, and in 1872 was elected governor of the State, holding that office for four years.

CARPENTER, Edmund Janes, American journalist: b. North Attleboro, Mass., 1845, Oct. 16. He was for many years on the editorial staffs of Providence, New Haven and Boston papers, and has published *A Woman of Shawmut: a Romance of Massachusetts Bay Colony*, 1640 (1892); *America in Hawaii* (1898); *A History of U. S. Influence in the Hawaiian Islands* (1898); *The American Advance* (1903).

CARPENTER, Edward, English socialistic writer: b. Brighton, England, 1844, Aug. 20. He was educated at Trinity Hall, Cambridge, and was for some time Fellow and lecturer there, as well as curate under the noted F. D. Maurice. In 1874 he gave up his fellowship and left the ministry, and until 1881 lectured on science and music in university extension work. He has since devoted his time to literary work, market gardening, and socialist propaganda. In 1884 he visited the United States in order to meet Walt Whitman. He has published *Towards Democrary; Love's Coming of Age; Angels' Wings; Adam's Peak to Elephanta; Iolaus: an Anthology of Friendship; Who Shall Command the Heart; The Art of Creation;* etc.

CARPENTER, Esther Bernon, American prose writer: b. Wakefield, R. I., 1848; d. 1883. She contributed to magazines; published *The Huguenot Influence in Rhode Island;* and *South Country Neighbors* (1887).

CARPENTER, Francis Bicknell: an American painter, 1830, Aug. 6—1900, May 23; b. in Homer, N. Y.; studied with Sanford Thayer and became an associate of the National Academy. He painted portraits of Presidents Pierce, Fillmore and Lincoln, William H. Seward, Charles Sumner, Henry Ward Beecher, Horace Greeley and John C. Fremont. His best known painting is the large historical picture, representing President Lincoln signing the Emancipation Proclamation. He wrote *Six Months in the White House with Abraham Lincoln.*

CARPENTER, Frank George, American journalist: b. Mansfield, Ohio, 1855, May 8. He has been connected with various newspapers, and has made several important newspaper tours. He has published a series of geographical readers; *Through Asia with the Children* (1898); *Through North America with the Children* (1891); *South America: Social, Industrial and Political* (1900).

CARPENTER, George M., American jurist: b. on the island of Rhode Island, Narragansett Bay, R. I., 1844; d. Katwyk, Holland 1896, July 31. After graduating from Brown University in 1864 he became a newspaper reporter, serving for several years on the staff of the *Press* and of the *Journal* of Providence. He later became court stenographer; studied law in his leisure moments; and after admission to the bar, entered into partnership in Providence with a former preceptor. When the laws of the State were to be revised in 1889 he was selected as one of the commission to perform that important duty, and upon the completion of that work was elected a judge of the State Supreme Court. When President Arthur created a vacancy in the United States District Court of Rhode Island by sending Judge Colt to the Circuit Court, he appointed Carpenter to the position thus left vacant, and as a judge in this court many important cases were tried before him, the most important of which was the government suit against the American Bell Telephone Company for annulment of the Berliner patent.

CARPENTER, George Rice, American literary critic; b. off the coast of Labrador, 1863, Oct. 25. He was graduated from Harvard University in 1886, and subsequently studied in Paris and Berlin. He was instructor at Harvard, 1888–90, professor of English in the Massachusetts Institute of Technology, 1890–3, and professor of rhetoric at Columbia University from 1893. He has written a *Life of John Greenleaf Whittier* (1902); *Elements of Rhetoric and Composition; Life of H. W. Longfellow; Principles of English Grammar;* etc.

CARPENTER, Gilbert Saltonstall: an American military officer; b. 1836, April 7; served in the Union army 1861–65. In recognition of his gallantry at El Caney, Cuba, 1898, during the war with Spain, he was commissioned a brigadier-general of volunteers; was promoted colonel of the 18th U. S. Infantry 1899, June 20; and brig.-gen. 1899, Dec. 5; and on the 26th of the same month was retired at his own request after 30 years of service.

CARPENTER, Henry Bernard, Irish Unitarian clergyman: b. Dublin, Ireland, 1840, April 22.; d. Sorrento, Maine, 1890, July 17. He was a brother of William Boyd Carpenter, bishop of Ripon, and was educated at Oxford University. He was for a time chaplain to the Earl of Belmore. He susbequently became a Unitarian, and coming to the United States in 1874 was pastor of the Hollis Street Church in Boston, 1878–87. He pub-

lished *Liber Amoris*, a volume of verse, and after his death a collection of his poems was edited by J. J. Roche (q.v.). He was a brilliant speaker and very popular as such.

CARPENTER, Joseph Estlin, English Unitarian scholar: b. Ripley, Sussex, 1844, Oct. 5. He was educated at University College, London, and Manchester New College (now at Oxford). He was minister of Oakfield Road Church, Clifton, 1866–9, and of Mill Hill Chapel, Leeds, 1869–75, and is now vice-principal of Manchester New College, and Case lecturer on comparative religion there. He is one of the very foremost living authorities as a Sanskrit scholar and biblical critic, and besides editing Ewald's *History of Israel* (Vols. III.–V.), translating Tiele's *Outlines of the History of Religion*, is the author of *Life and Work of Mary Carpenter* (1879); *Life in Palestine* and *The First Three Gospels: Their Origin and Relations* (1890). With Rhys Davids he has edited the *Sumairgala Vilasini* (1886); and the *Digha Nikava* (1889). With Harford-Battersby he has also edited the Hexateuch according to the revised version. He has also written and edited other works.

CARPENTER, Lant, English Unitarian clergyman: b. Kidderminster, 1780, Sept. 2; d. at sea, 1840, April 5. Designed for the ministry, he was sent in 1797 to the Northampton Academy. That school being temporarily discontinued, young Carpenter was placed at Glasgow College, where, however, he did not continue the length of time necessary to take his degree. Leaving college in 1801, he spent some time in teaching, and as librarian of the Athenæum, Liverpool. At Liverpool, Carpenter's views were so clearly in sympathy with those of the Unitarian denomination generally, that he received several invitations to the pastoral charge of Unitarian congregations, and a call to a professorship in their college at York. In 1805 he accepted a call to Exeter, where he continued for 12 years. In 1806 the University of Glasgow gave him the degree of LL. D., although he had applied only for the degree of M.A. From Exeter he removed to the pastoral charge of the Unitarian congregation at Bristol (1817), where he continued until his death, which occurred by falling from a vessel between Naples and Leghorn, while on a tour for his health. Dr. Carpenter's piety was of an eminently practical turn. The instruction of children was an object of constant interest. Amid all his pastoral and literary labors he always found time and energies to devote to juvenile instruction, and, even against the prejudices of his congregations, established Sunday-schools among the children of Exeter and Bristol. In his pastoral charges at Exeter and Bristol, he was active in co-operation with others in the establishment of libraries, schools, savings banks, and institutions for general improvement and welfare. His published work's are mainly theological and doctrinal, in support of the Unitarian sentiments he had early espoused. Among his more important works are *An Introduction to the Geography*

of the New Testament; Unitarianism the Doctrine of the Gospel; Examination of the Charges Against Unitarianism; Harmony of the Gospels; and a volume of sermons. Mild in controversy, faithful in humane labors, and practically devoted to the improvement of society, Dr. Carpenter was greatly respected even by those who were his most staunch antagonists in theology.

CARPENTER, Louis G.: an American engineer; b. 1861, March 28; was graduated at Michigan Agricultural College 1879, and served as instructor of Mathematics there; became prof. of Engineering at the Colorado Agricultural College, and meteorologist and irrigation engineer at the Agricultural Experiment Station 1888. Shortly afterward he organized the first course in irrigation given in any American college. In 1891 he established the American Society of Irrigation Engineers. He has published Government Reports, *Artesian Wells in Colorado* (1890); *Irrigation Progress in Colorado* (1891).

CARPENTER, Louis H.: an American military officer b. 1839, Feb. 11; served in the civil war; was aide to Gen. Sheridan, and was commissined colonel of volunteers, 1865. He subsequently served in various Indian campaigns. In 1897 he was made colonel of the 5th U. S. Cavalry, and 1898 brig.-gen. of volunteers. For gallantry during the Spanish-American war, and especially as commander of the Department of Porto Principe, Cuba, he was made Brig.-Gen. U. S. A., 1899. Oct. 18, and was retired on the following day.

CARPENTER, Margaret Sarah, English painter: b. Salisbury, England, in 1793; d. London, 1872, Nov. 13. Her first studies in art were obtained from the collection of Lord Radnor at Longford Castle, and later she competed for several years for the prizes offered by the Society of Arts, several times successfully, and once being awarded the gold medal for the study of a boy's head. In 1814 she went to London where she secured for herself a wide reputation as a portrait painter; in that year her exhibits of a portrait of Lord Folkestone at the Royal Academy and the pictures *Fortune-Teller* and *Peasant Boy* at the British Institution at once gained for her great popularity and marked the beginnings of her rapid rise. In 1866 upon the death of her husband, W. H. Carpenter, keeper of the prints and drawings in the British Museum, she was granted by the Queen an annual pension of £100. Between the years 1816–1866 she exhibited 147 pictures at the Royal Academy, 50 at the British Institution and 19 at the Society of British Artists. Chief among her pictures are: *Lord Kilcoursie and Lady Sarah de Crespigny* (1812); *Lord Folkestone* (1814); *Mr. Barring* (1815); *Sir Henry Bunbury* (1822); *Lady Eastnor* (1825); *Lord de Tabley* (1829); *Justice Coleridge* (1830); *Lady Denbigh* (1831) *Mrs. Herries* (1832); *Lady King, daughter of Lord Byron* (1835); *Archbishop Sumner* (1852); etc. In the National Portrait gallery are also three portraits from

her brush—those of Richard Parkes Bonington the painter; John Gibson, the sculptor; and Patrick F. Tytler, the historian. In the South Kensington Museum are three pictures; *Devotion* (1822); *The Sisters* (1840); and *An Old Woman Spinning.*

CAR'PENTER, Mary: philanthropist: 1807–77; daughter of a Unitarian minister of Bristol, and sister of Dr. William B. Carpenter. She was active in the movement for the reformation of neglected children, and, besides advocating their cause in her writings, she founded several reformatories for girls, one of which, the Redhedge Reformatory, she superintended. In her philanthropic labors she visited India three times, and in 1871 instituted the National Indian Assoc., whose journal she edited. Besides her reformatory writings she pubished *Our Convicts* (1864), a book which drew public attention to the treatment of young criminals; *The Last Days of the Rajah Rammohun Roy;* and *Six Months in India.* See *Mary Carpenter,* by J. E. Carpenter (1879).

CARPENTER, Matthew Hale: lawyer and U. S. senator: 1824, Dec. 22—1881, Feb. 21; b. Moretown, Vt. He entered the U. S. Mil. Acad. 1843, remained there two years then studied law with Rufus Choate, was admitted to the bar, and removed to Milwaukee, Wis. to practice, 1848. He was elected U. S. senator as a republican to succeed James R. Doolittle, and served 1869, Mar. 4—1875, Mar. 3; re-elected to succeed Timothy O. Howe, and served from 1879, Mar. 18, till his death. He was eminent in the practice of his profession and in the councils of his party, and one of the most striking figures of the 'reconstruction' period.

CARPENTER, Rolla Clinton, American engineer: b. Orion, Mich., 1852, June 26. He was educated at the Michigan Agricultural College, the University of Michigan, and Cornell University; was professor in the Michigan Agricultural College, 1878–90, and later became professor of experimental enigneering in Cornell. He has written *Experimental Engineering; Heating and Ventilation;* and numerous papers on engineering topics.

CARPENTER, Stephen Cutter, American journalist: b. England; d. about 1820. He came to the United States in 1803, and settled in Charleston, S. C., where he founded and published with John Bristed the *Monthly Register Magazine and Review of the United States.* Later he was editor of the *Mirror of Taste and Dramatic Censor,* in which appeared some clever sketches of American actors. His works include: *Memoirs of Jefferson, Containing a Concise History of the United States from the Acknowledgment of Their Independence, with a View of the Rise and Progress of French Influence and French Principles in that Country* (1809); *Select American Speeches, Forensic and Parliamentary, with Prefatory Remarks, a Sequel to Dr. Chapman's Select Speeches* (1815); and under the pen-name of 'Donald Campbell' *Overland Journey to India* (2d ed. 1809–10, and *Letter on the Present Times.*

CARPENTER, William, American author; b. England, 1830; d. Baltimore, Md., 1896, Sept. 1. He was by trade a printer and had worked for various publishing houses in London, but in 1879 he went to the United States, settled in Baltimore, and began to teach stenography. He first brought himself into public notice by the publication of his theories concerning the shape of the earth in a poem, *The Earth not a Globe, by Common Sense* (1864). He then attempted to explain and defend his theories both by science and religion in numerous prose works, among which were *Sir Isaac Newton's Theoretical Astronomy examined and refuted by Common Sense; Water not Convex: the Earth not a Globe; Bosh and Bunkum; Religious Arguments why the Earth is not Round; Proctor's Planet Earth,* in answer to Proctor's *Lessons in Elementary Astronomy.* Among his other works may be mentioned: *Something about Spiritualism: a Reply to Professor Airy's Ipswich Lectures to Workingmen; Mr. Lockyer's Logic; The Delusion of the Day;* etc. He also published two magazines, *Carpenter's Folly* (1887), of which only a few numbers were issued, and *Shorthand* (1893–4).

CARPENTER, William, English editor and author: b. Saint James, Westminster, 1797; d. Colebrooke Row, Islington, 1874, April. 21. Being the son of a poor tradesman he was put to work early in life and obtained no education, but entering the service of a bookseller he soon learned to speak fluently several ancient and modern languages, and took great interest in the study of biblical subjects. He wrote several works on religious subjects and was connected in an editorial capacity with a number of periodicals. With William Greenfield he edited the *Scripture Magazine* which was later known as *Critica Biblica* (4 vols., 1824–7); in rapid succession he became editor of *Shipping Gazette* (1836); *Era* (1838); *Railway Observer* (1843); *Lloyd's Weekly News* (1844); *Court Journal* (1848); *Sunday Times* and *Bedfordshire Independent* (1854). He issued a publication *Political Letters* (1830–1), which he claimed was not liable to the stamp duty on newspapers, but at his trial in 1831 was convicted and imprisoned for some time. Carpenter wrote many treatises on the subject of political reformation and from 1851–3 was honorary secretary to the Chancery Reform Association. Among these works are: *The Elector's Manual* (1832); *The Political Text-book* (1833); *Peerage for the People* (1841); *The Corporation of London as it is and as it should be* (1847). Of his other publications the most noteworthy are: *Sancta Biblica* (1825); *Calendarium Palestinæ, exhibiting the Principal Events in Scripture History* (1825); *Old English and Hebrew Proverbs Explained and Illustrated* (1826); *Scripture Natural History* (1828); *Anecdotes of the French Revolution of* 1830 (1830); *Life and Times of John Milton* (1836); *The Biblical Companion* (1836); *Relief for the Unemployed : Emigration and Colonization Considered* (1841); *Clarke's Christian Inheritance* (5th ed. 1843); *A Comprehensive Dictionary of English*

Synonyms (6th ed. 1865); *An Introduction to the Reading and Study of the English Bible* (3 vols., 1867–8); etc.

CARPENTER, William Benjamin, c.b., m.d., ll.d., f.r.s., f.l.s., f.g.s.: physiologist and naturalist: 1813–1885, Nov. 10; b. Exeter; son of a Unitarian minister. In 1839, the year of his graduation in Edinburgh, he published *Principles of General and Comparative Physiology*, one of the earliest works giving a general view of the science of life. As the treatise grew in size in successive editions, it was divided into two—*The Principles of Comparative Physiology*, and *The Pripciples of General Physiology*. These works, together with *The Principles of Human Physiology* (1846, 9th ed. 1882), and *The Principles of Mental Physiology* (1874), form a complete cyclopedia of biological science. Carpenter likewise published *A Manual of Physiology; The Microscope, its Revelations and its Uses* (6th ed. 1881); *Physiology of Temperance and Total Abstinence;* and numerous memoirs on various departments of physiology, microscopical anatomy, and natural history, in the *Philosophical Transactions*, etc. His most important original researches are *On the Structure of Shells; On the Development of Purpura Lapillus;* and *On the Structure, Functions, and General History of the Foraminifera.* For several years he edited *The British and Foreign Medico-Chirurgical Review*, and he was one of the editors of *The Natural History Review.* In 1849, he was appointed prof. of medical jurisprudence at Univ. College; soon afterward examiner in physiology and comparative anatomy in the Univ. of London, and in 1856 registrar to that univ., which office he held till 1879. In 1861, the royal medal was awarded to him by the Royal Soc.; in 1883, the Lyell medal by the Geological Soc.; and in 1873, he was elected a corresponding member of the Institute of France. He took a chief part in the government expeditions sent out in 1868, '69, '70 for deep-sea exploration in the n. Atlantic; and afterward he contributed largely to the discussion of the vexed question of ocean-circulation in the Journal of the Royal Geographical Soc. and other periodicals. For a summary of his views, see *Enc. Brit.* 9th ed., Atlantic. He advocated the doctrine of a *vertical circulation* sustained by opposition of temperature only, independent of and distinct from the *horizontal* currents produced by winds: see Gulf Stream.

CARPENTER, William Henry: American philologist b. Utica, N. Y., 1853, July 15. He received a university education in the United States and Europe, became instructor in rhetoric and lecturer on North European literature in Cornell University in 1883, instructor of German and Scandanavian languages in Columbia University, adjunct professor of Germanic languages and literature in the same institution in 1890, and subsequently professor of Germanic philology there. He has published several works in the line of his specialty.

CARPENTRY.

CAR'PENTRY : art of framing timber for architectural and other purposes. Technically, the term is restricted to the framing of heavy work, such as the roofs, floorings, partitions, and all the wood-work concerned in maintaining the stability of an edifice, while the minor and ornamental fittings are called joinery ; but, popularly, the workman who does either kind of work is called a carpenter.

The preliminary preparation of timber is the work of the sawyer, who, by the saw-mill or pit-saw, divides the trunks of trees into planks, etc. ; these are further divided by the carpenter, who uses hand-saws of various kinds, according to the work. For dividing wood into separate pieces in the direction of the fibre, the *rippng-saw* is used ; for cross cutting, or sawing thin pieces in the direction of their length, the common *hand-saw* or the finer toothed *panel-saw ;* for making an incision of a given depth, and for cutting small pieces across the fibre, the *tenon saw,* the *sash-saw,* or *dovetail-saw* is used. These are thin saws, stiffened by a strong piece of metal at the back to prevent crippling. When a curved cut is to be made, a very narrow saw without a back, called a *compass-saw* or a *keyhole-saw,* is used. The general name for these is *turning-saws;* they have their plates thin and narrow toward the bottom, and each succeeding tooth finer, and the teeth are not bent on contrary sides of the plate for clearing, as in broad saws.

The surface of wood is smoothed by planing. According to the work, different kinds of planes are used: the *jack-plane,* large and rough, for taking away the rough of the saw; the *trying-plane,* for bringing the surface perfectly level and true, or the *long-plane* for the same purpose, where the work is of great length, as for the joining edges of long boards to be glued together. The *smoothing-plane,* much smaller than these, gives the smooth finished surface. The *spoke-shave,* a sort of plane with a double handle, is used for paring and smoothing rounded work.

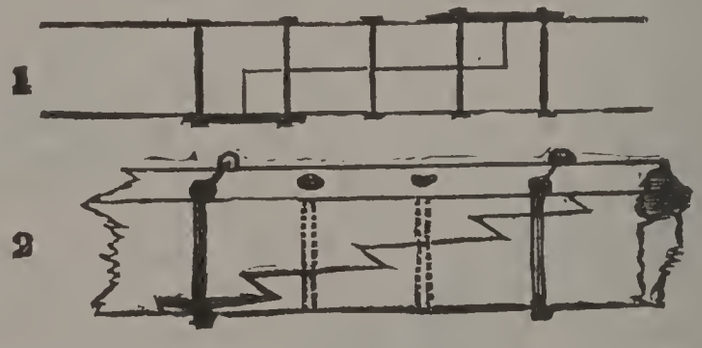
Ornamental moldings are cut by means of molding-planes, which have their cutting edges curved to the required pattern. A good stock of these is one of the most expensive items of the tool-chest.

The paring of wood, and the cutting of rectangular or prismatic cavities, notches, etc., are done by means of *chisels.* Those for cutting across the fibre are called *firmers* or *paring-chisels ;* those for cutting deep and narrow cavities, *mortise-chisels,* which are made very thick and narrow and fitted in the handles with a strong flange, to bear heavy blows with the mallet. Chisels for paring concave surfaces are called *gouges.* For boring holes, *brad-awls, gimlets, centre-bits,* and *gouges* are used—the two latter, fixed in a *stock* or revolving handle, are used for large holes. When it is required to ascertain if an angle be square, or of any given inclination, the *square* or the *bevel,* set to the required angle, is applied to test the work as it proceeds. When parallel edges are required, the *marking gauge* is used to draw the line to be worked to. When a simple straight line is re-

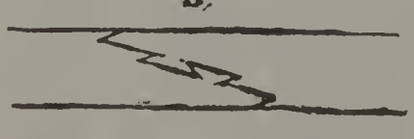
quired for working to, a piece of string is chalked, then stretched tightly over the wood and lifted in the middle, when, by its recoil, it strikes the wood and leaves a straight chalked line. The *straight-edge*, a strip of wood with one of its edges perfectly straight, is applied to detect superficial irregularities. The operation of planing the edge of a board straight is called *shooting*, and such edges are said to be *shot*. When the joiner requires to ascertain whether the surface of a piece of wood is all in one plane, he takes two slips of wood with edges perfectly straight and parallel, and of equal width; these slips, called *winding-sticks*, are placed edge upward, one at each end, across the board, and the workman looks in the longitudinal direction of the board over the upper edges, and if the two edges be not in the same plane the board is planed down at the elevated parts until it is *out of wind*. For setting work level, a spirit-level, set in a wooden frame, or a plumb-level is used. For further description of the tools alluded to above, and in the rest of this article, see the special titles.

When two pieces of timber have to be united at their ends, as in lengthening the beams for roofing, partitions, the masts and keels of ships, etc., the operation is called *scarfing*, and the joint a *scarf*. The methods of scarfing are very numerous; those figured below will serve to illustrate the principal.

Fig. 1 is a section showing the common or single step scarf, with plates, and the bolts passing through. Fig. 2



is the French scarf, called *traits de Jupiter*, or Jupiter's lightnings, with the straps and bolts shown. In these the scarf itself gives no resistance to the longitudinal strain. Fig. 3 shows a scarf in which the resistance of the wood to splitting is made available.



The following are the principal rules for scarfing as stated by Tredgold.

The length of the scarf should be, if bolts are not used —in oak, ash, or elm, six times the depth of the beam; in fir, twelve times the depth of the beam. If bolts and indents are combined the length of the scarf should be—in oak, ash, or elm, twice the depth of the beam; in fir, four times the depth. In scarfing beams to resist transverse strains, straps driven on tight are better than bolts. The

sum of the areas of the bolts should not be less than one-fifth the area of the beam, when a longitudinal strain is to be borne. No joint should be used in which shrinking or expansion can tend to tear the timbers. No joint can be made so strong as the timber itself. When two pieces of timber are connected so that the joint runs parallel with the fibres of both, it is called a *longitudinal joint;* but when the place of the joint is at right angles to the fibres of both, an *abutting joint.*

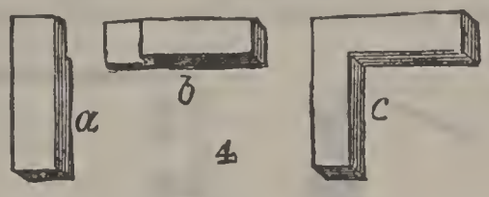
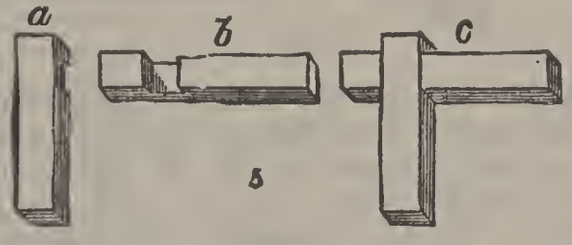
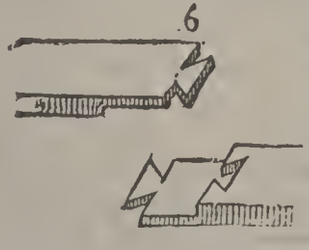


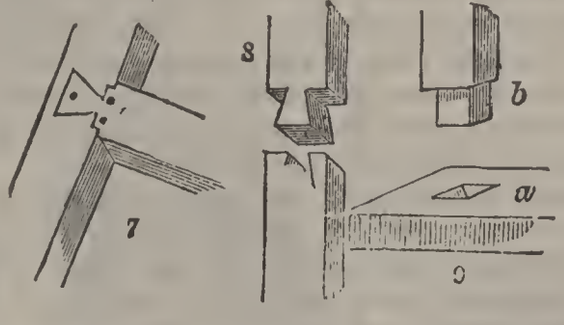
Fig. 4 is an example of common and simple joint, for connecting timbers at right or other angles. It is called



a *notched joint,* and requires bolting. Fig. 5 is a notched joint for crossing timbers. In both figures, *a* and *b* represent the pieces before joining, and *c* when united. Timbers may be joined end to end by a simple notching, or by dovetailed notching, as fig. 6. Other applications of dovetailing timbers are shown in figs. 7 and 8. Tie-beams, connected to wall-plates, as in fig. 7, are said to be cogged or cocked, whether dovetailed or simply notched.

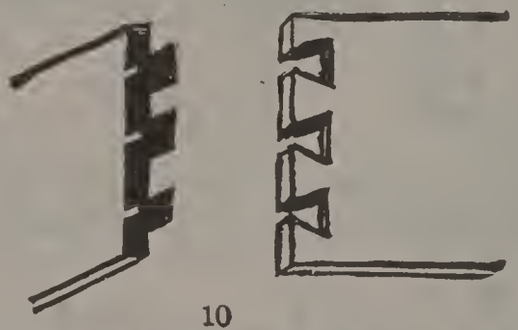


The mortise and tenon joint is shown in fig. 9; the cavity in *a* is the mortise, the projection on *b* the tenon. A very short tenon is called a *stub tenon.* When a second



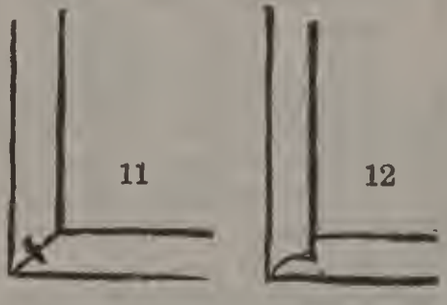
minor tenon is made projecting from the principal tenon, it is called a *tusk tenon.*

The above joints are some of those used in heavy work, or carpentry proper. For lighter joiner's work, similar methods of framing are used, only adapted to the work—to boards generally instead of beams; thus, for example, the mortise and tenon joint, made oblong instead of square, is used in framing doors, shutters, drawing-boards, or any other kind of extended superficial work liable to warping. An outside frame or skeleton is made with a panel or panels in the middle, and each piece of the frame has the grain at right angles to the piece into which it is mortised, in order that they shall eventually correct the warping.



10

Dovetailing is extensively used for connecting boards at right or other angles, as in making boxes, drawers, etc. The common dovetail is shown in fig. 10; the common mitre, fig. 11; the lapped mitre, fig. 12; and the lapped and tongued mitre, fig. 15. Common dovetailing is usually glued. Nails or pins and glue are used with the mitre and other notched joints.



11 12

Boards may be united at their edges to form an extended surface, as a flat plank partition, etc., either by simple gluing of the shot edges, by a *rebate*, or by a plowed groove and a corresponding projection. The rebate is cut by means of rebating plane; very frequently it is combined with a bead, the usual joint for wooden partitions. The groove, a sort of extended mortise, is cut by a plane with a projecting iron called the *plow*.

In all cases where glue is used in joints it should be applied to both surfaces, which should be rubbed and pressed together until nearly all the glue is forced out, then kept pressed by a cramp or weights. White lead is used for outside joints.

For special departments of carpentry such as roofs, staircases, etc., see the respective titles.

CARPET, n. *kâr'pĕt* [OF. *carpite*, a carpet—from mid. L. *carpĕtă*, plucked wool, any quilted fabric—from L. *carpĕrĕ*, to pluck: F. *charpie*, lint: Sp. *carpeta*, a bed cover. It. *carpita*, a coarse counterpane—originally used for bed-covers and table-covers]: the woven or felted stuff made of wool, variously colored, used to cover rooms, stairs, etc.: V. to cover with a carpet. CAR'PETING, imp.: N. carpets in general; stuff for making carpets. CAR'PETED, pp. TO BE ON THE CARPET or TO BE ON THE TAPIS [F. *tapis*, a carpet]: means that a matter is under consideration. CARPET-KNIGHT—*lit.*, a knight not dubbed on the field; a soldier who has never known the hardships of actual service; a civilian who has received the honor of knighthood; an effeminate man who is averse to manly sports. CARPET-BAG, a travelling-bag made of the same materials as carpets. CARPET-BAGGER, term of contempt for newcomers to a region who have, or are accused of having, interests diverse from those of the old inhabitants.

CARPETS: floor-coverings, usually woven or felted. Woven C. were used first in the East, where the custom of sitting crossed-legged on the floor still renders them especially useful. Our rude European forefathers covered the floors of their houses with rushes, hair, or straw; and in Norwegian farm-houses, where many ancient customs remain, the floor of the best room is commonly strewed with juniper-twigs. The first step toward a woven carpet was made by plating rushes to form a matting.

The principal varieties of C. now in use are the Turkey, the Axminster, the Brussels, the Wilton, the Venetian, the Dutch, the Kidderminster or Scotch, Whytock's tapestry and velvet pile, and the printed felt carpet.

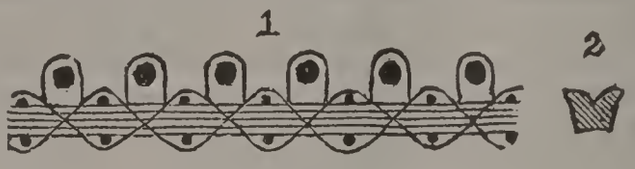
The real Turkey carpet is made in one piece; those manufactured for the orientals are usually too small for use in this country. The patterns consist merely of curved and angular strips of variegated but dark and unobtrusive colors. The warp is of strong linen or cotton, to which bunches or tufts of colored worsted are tied according to the pattern, a drawing of which is placed before the weaver to copy. The surface is afterward shorn level. Rugs are made in a similar manner; the colored worsteds are tied very rapidly by young girls.

The *Axminster Carpet* is merely the English-made Turkey carpet, formerly manufactured as above at Axminster, in Devonshire. They are usually made to order, and of the size required for the room; from the tedious nature of the process of manufacture, they are very expensive.

Templeton's Patent Axminster Carpet is a very beautiful fabric, much resembling that from which it derives it name, but wrought on the chenille principle.

The *Brussels Carpet* is a mixture of linen and worsted, but, like the Turkey carpet, the worsted only is shown on the upper surface. The basis or cloth is a coarse linen fabric, and between the upper and under threads of the weft, several (usually five) worsted threads of different colors are firmly bound in. The pattern is produced by drawing to the surface, between each reticulation of the cloth basis, a

portion of the worsted thread of the color required at that spot to produce the pattern; these updrawn portions are formed into loops by being turned over wires, which are af-



Carpet Weaving.

terward withdrawn, and the loops thus left standing above the basis form the figured surface of the carpet. This will be better understood by reference to the diagram, fig. 1, which is a slightly magnified section of a Brussels carpet, cut across the wires and the threads of the weft. The large dots above are the sections of the wire, the smaller dots those of the weft or shoot threads; the waved lines, the warp; the parallel lines, the five colored worsted threads; and the loops over the large dots are the updrawn worsted threads forming the surface of the carpet. The machinery and processes by which this arrangement is produced are complex, and require to be seen to be fully understood.

The *Wilton carpet* is made like the Brussels, but the wire has a groove in its upper surface, fig. 2, and instead of being drawn out, it is liberated by passing a sharp knife through the worsted loop into this groove, and thus making a velvet pile surface instead of the looped thread.

The *Venetian carpet* is produced in a common loom, and the pattern is all in the warp, which alone is visible, as it incloses the weft between its upper and under surfaces. The patterns are generally checks or stripes ; the latter are used chiefly for stair carpets.

The *Dutch carpet* is a coarser and cheaper variety of plain Venetian, sometimes made wholly of hemp, or of a mixture of coarse wool and cow hair.

The *Kidderminster* or *Scotch carpet*, often called *Ingrain*, has usually a worsted warp and woolen weft, and the pattern is made by the combination of the colors of each. Three-ply C. of this kind are the most durable of the moderate-priced C.; the patterns are not so brilliant as those of the Brussels or the tapestry, but, being ingrained and woolen throughout, they retain their character until worn through. This, and the Venetian and Dutch C., exhibit their patterns nearly similar on both sides, and are therefore reversible.

Whytock's tapestry and velvet pile carpet, as it is now frequently called, is becoming extensively used as a cheap substitute for Brussels and Wilton, which it is made to resemble very closely in the brilliancy and variety of pattern. The manufacture of this carpet is very curious and ingenious. Instead of five colored yarns, only one of which is drawn to the surface at any one place, while the other four remain buried between the upper and under threads of the cloth basis, a single colored yarn is used, and the variety of color produced by dyeing it of various colors at intervals of its length. The yarn is coiled upon a

drum, and printed by means of rollers in such a manner that when the threads that encompass the roller shall be uncoiled and laid in lines side by side, they shall present an elongated printing of the pattern, so that a rose, for example, the outline of which should be nearly circular, will be an oval, with length equal to four times its breadth. When, however, the thread is looped over the wire, four inches of yarn being used for an inch of the carpet pattern, this elongation is exactly compensated, and the rose appears in its proper proportions. The machinery required for this is, of course, much simpler than that for the Brussels, only one yarn having to be looped, and that always in the same manner.

The *printed felt C.* are, as the name implies, simply made by printing colors on felt. These are used chiefly for bedroom carpets.

A very beautiful fabric has also been introduced, called the *patent wool mosaic*, formed by cementing a velvet pile upon plain cloth. It is used for rugs, etc. The pile is formed by stretching lengths of woolen yarn between plates of finely perforated zinc, placed several yards apart, the colors of the threads being arranged so that their ends shall show the pattern. The mass of yarn is then inclosed in a case, open at both ends, and compressed without deranging the fibres; and by means of a piston or ram at one end, a portion of this mass of yarn is forced forward, the ends thus projecting are glued to the plain cloth, and when dried, are cut off to the length required for the pile. In this manner, several hundred slices are made from one setting of the yarn mosaic, and as many rugs produced.

CARPET-BEETLE: a small beetle (*Anthrenus scrophulariæ*), often wrongly called 'buffalo-bug.' In the grub or larval state, it is injurious to carpets and similar fabrics. It is an active, brown, hairy larva, the size of a grain of wheat, which works in a hidden manner from the under surface, sometimes making irregular holes, but more frequently following the floor-cracks and cutting long slits in a carpet. This insect was brought from Europe about 1874, and is abundant in the New England States and westward to Kansas. The adult insect is a minute, broad-oval beetle, about three sixteenths of an inch long, with a red stripe down the middle of the back. When disturbed it folds up its limbs and feigns death. As a general thing the beetles begin to appear in the autumn, and continue to issue, in heated houses, throughout the winter and following spring. Soon after issuing they pair, and the females lay their eggs in convenient spots. The eggs hatch in a few days, and the larvæ develop rapidly. Their development is retarded by cold weather or by lack of food, and they may remain alive for an indefinite period. When, under normal conditions, the larva reaches full growth, the yellowish pupa is formed within the last larval skin. from which the beetle emerges later. The beetles are day-fliers, and when not engaged in egg-laying are attracted to the light. They fly to the windows, and may

often be found upon the sills or panes. The carpet beetle is very difficult to exterminate, and the best preventative is the use of movable rugs on hard-wood floors. Suspected carpets should be taken up, beaten, sprayed out of doors with benzine, and then be well aired. Before relaying the carpet, tarred roofing paper should be laid upon the floor.

Another similar pest is the black carpet-beetle (*Attagenus piceus*), whose larva is readily distinguished from the buffalo-bug by its cylindrical shape and lighter color. It is not so fond of working in cracks, and cutting long slits in carpets, and in general is not so dangerous a species as the other. It sometimes produces in feather-beds a peculiar felting of the ticking. It has also been known to infest flour-mills, and is to a certain extent a feeder upon cereal products. Two years are required for its development from egg to beetle. Consult Howard and Marlatt, *Household Insects* (U. S. Department of Agriculture, Washington, 1896).

CARPET SWEEPERS. Carpet sweepers of a crude pattern were made in England hundreds of years ago, but not until 1876 was this device seriously considered as a time-saving, labor-saving household article. Several attempts had been made in this country as early as 1856 to produce a satisfactory carpet sweeper, but all fell short of the requirement. To Mr. M. R. Bissell is due the credit of producing the first carpet sweeper that did its work properly and satisfied the user, and over 9,000,000 Bissell carpet sweepers are now in use throughout the world.

It is justly claimed for the carpet sweeper that it is at once the modern sanitary device for sweeping carpets and rugs, that it performs the work in one quarter the time the corn broom requires, and with 95 per cent. less effort; that it raises no dust, thus protecting the furniture, draperies, bric-à-brac, etc.; that it confines all the dangerous germs within the pan receptacles, after which the contents can be burned, or buried, thus promoting health and cleanliness at the same time.

CARPI, *kâr'pē*, Girolamo da: 1501–56; b. Ferrara: painter. He was a pupil of Garofalo, but conceived a vehement admiration for the works of Correggio, which he copied at Parma, Modena, etc., till his style was a perfect imitation of that master's. He sold his own paintings for Correggio's, and some now ascribed to the latter are probably Carpi's. His best are a *Descent of the Holy Spirit* in the Church of St. Francis at Rovigi; a *St. George* and a *St. Jerome* at Ferrara; and a *Madonna*, an *Adoration of the Magi*, and a *St. Catherine*, at Bologna.

CARPINI, *kâr-pē'nē*, Johannes de Plano: Franciscan monk: b. Capitanata, Naples, about 1210: one of the six friars selected by Pope Innocent IV. to proceed to the court of the emperor of the Mongols, whose warlike advances in 1246 threw Christendom into consternation, in order to pacify the terrible nomadic warriors,

and, if possible, convert them to Christianity. The mission, accomplished under dreadful hardships, though without results so far as its main objects were concerned, was nevertheless far from unfruitful. Prior to this, the most monstrous fables had prevailed regarding the Tartars; and Carpini's narrative, which gave a truthful and striking picture of their numbers, character, and civilization, was the first to bring these myths into discredit. In this book he also argued, with great good sense, for a union among Christian princes as the only means of resisting those fierce hordes in their progress westward. As a book of travels, its accuracy has been attested by modern travellers. Hakluyt copied most of this work at second-hand, into his first volume of *Navigations and Discoveries.* The date of Carpini's death is not known.

CARPOCLONIUM, n. *kâr′pō-klō′nĭ-ŭm* [Gr. *karpos,* fruit; *klōnĭŏn,* a small branch or shoot]: in *bot.,* the free spore case of certain Algæ.

CARPOCRATES, *kăr-pŏk′ra-tēz,* or CARPOCRAS, *kâr-po-krâs:* philosopher: lived under Hadrian (A.D.130) at Alexandria, where he founded the Gnostic sect of Carpocratians. According to him, the essence of true religion consisted in the union of the soul with the Monas or highest God, by means of contemplation, which elevated it above the superstitions of the popular faith, and liberated it from submission to the common laws of society. He only is to be reckoned wise who attains to this. Among those who have done so, are Jesus, Pythagoras, Plato, and Aristotle. The cosmogony of Carpocrates was of the usual Gnostic character, the central peculiarity of which was the belief that the worlds were created by angels. Carpocrates also held the doctrine of the transmigration of souls. His followers existed down to the 6th c. Whether or not they were guilty of the abominations ascribed to them, is more than can be affirmed; our only information concerning them being derived from *orthodox* writers of those times, who were in the habit of slandering heretics.

CARPOGONIUM, n. *kâr′pō-gō′nĭ-ŭm* [Gr. *karpos,* fruit; *goneus,* procreator, parent]: in *bot.,* in certain fungi, the twisted end of a branch of mycelium, forming the female organ.

CARPOLITES, n. plu. *kâr′pō-līts,* or CAR′POLITHES, *-līthz* [Gr. *karpos,* fruit; *lithos,* a stone]: in *geol.,* generic term applied to fossil fruits, which, in the present state of our knowledge, it is impossible to refer more precisely to their place in the vegetable kingdom. Of 100 species described, 70 belong to the Carboniferous system.

CARPOLOGY, n. *kâr-pŏl′ŏ-jĭ* [Gr. *karpos,* fruit; *logos,* discourse]; the part of botany which treats of the structure of fruits and seeds; a treatise on fruit. CARPOL′OGIST, n. *-jĭst,* one who.

CARPOPHAGA, n. *plu. kâr-pŏf′ă-gă* [Gr. *karpos,* fruit; *phago,* I eat]: fruit-eating animals, a section of the Marsupialia. CARPOPHAGOUS, a. *kâr-pŏf′ă-gŭs,* living on fruits.

CARPOPHORE, n. *kâr'pō-fōr* [Gr. *karpos*, fruit; *phorĕō*, I carry or bear]: in *bot.*, a stalk raising the pistil above the whorl of the stamens, as in the caper; the same as *gynophore.*

CARPUS, n. *kâr'pŭs* [Gr. *karpos*, the wrist]: the small bones forming the wrist, consisting in man of eight small bones arranged in two rows. CARPAL, a. *kâr'păl*, belonging to the wrist: see HAND: FOOT: SKELETON.

CARPZOV, *kârp'tsof*, JOHANN GOTLOB: 1679–1757: son of Johann Benedict Carpzov (1607–57), prof. of theology at Leipzig; of a family distinguished in law, diplomacy, linguistics, and theology; descended from Simon Carpzov, burgomaster of Brandenburg, middle of 16th c. Johann Gotlob Carpzov was a theologian and prof. of languages at Leipzig, author of an introduction to the canonical books of the Old Test., also a *Critica Sacra Veteris Testamenti.*

His nephew, JOHANN BENEDICT CARPZOV, 1720–1803; was prof. of philosophy at Leipzig, and of poetry, Greek, and theology at Helmstadt.

CARQUINEZ, or KARQUENAS, *kâr-kē'nĕs:* strait in Cal., with a length of 7 m., between Suisun Bay and San Pablo Bay.

CARR, *kâr*, EUGENE ASA, American army officer: b. Concord, N. Y., 1830, March 20. He was graduated at the United States Military Academy in 1850, and joined the Mounted Rifles. He accompanied the Sioux Expedition in 1855, and was active in suppressing the insurrections on the Kansas border in 1856. In 1860 he was engaged in a campaign against the Comanche Indians. He was in active service throughout the Civil War, commanding the 4th Division of the Army of the Southwest, and subsequently acting as commander of the same army. He commanded a division in the Vicksburg campaign in 1863, and led the assault on the works of that city, May 18. In December, 1863, he was assigned to the Army of Arkansas. At the close of the war he was promoted to brigadier-general, U. S. A., and brevetted major-general of volunteers. In 1868–9 he was engaged against the Sioux and Cheyenne Indians, and afterward took part in other expeditions against hostile Indians. He fought in 13 engagements with Indians, was four times wounded in action, and received a congressional medal of honor and the thanks of the legislatures of Nebraska, Colorado, and New Mexico. He was retired in 1893.

CARR, FRANK OSMOND: English composer: b. near Bradford, England, 1858, April 23. He was educated at Cambridge University from which he received the degree of doctor of music in 1891. He has furnished the music to the opera librettos of *Faddimir*, *Joan of Arc*, and *Out of Town*, by Arthur Reed Ropes (q.v.), and also that for W. H. Gilbert's opera, *His Excellency.*

CARR, HENRY LASCELLES: English journalist: b. Knottingly, Yorkshire, 1841; d. 1902, Oct. 5. He was educated for the Anglican priesthood at St. Aidan's Theological Col-

lege, Birkenhead, but after qualifying for orders decided upon a literary career. After being for some time on the staff of the Liverpool *Daily Post*, he removed to Cardiff, where he was successively sub-editor, manager, editor, and part proprietor of the *Western Mail*. He retired in 1901. He published *Yankee Land and the Yankees; Letters from the United States of America*.

CARR, Joseph Bradford: American military officer: b. Albany, N. Y., 1828, Aug. 16; d. Troy, N. Y., 1895, Feb. 24. He joined the militia in 1849, and rose to the rank of colonel. In 1861 he was appointed colonel of the 28th New York Volunteers, and led them at the battle of Big Bethel and in McClellan's Peninsular campaign. He took part in the battles of Chancellorsville and Gettysburg, and for his bravery throughout the war he was brevetted a major-general of volunteers. After the war he became prominent in Republican politics in New York State, and was elected secretary of state in 1879, 1881, and 1883. In 1885 he was an unsuccessful candidate for lieutenant-governor.

CARR, Joseph William Comyns: English art critic and dramatist: b. 1849. He was educated at London University, and was admitted a barrister of the Inner Temple in 1869. He has been English editor of *L'Art* and art critic of the *Pall Mall Gazette*. He has published *Drawings by the Old Masters* (1877); *The Abbey Church of Saint Albans* (1878); *Examples of Contemporary Art* (1878); *Essays on Art; Papers on Art; A Fireside Hamlet; The United Pair; The Naturalist; The Friar; Forgiveness; King Arthur*.

CARR, Lucien: American archæologist: b. Lincoln county, Missouri, 1829. He received a collegiate education and from 1876 to 1894 was assistant curator in the Peabody Museum. He has written *Mounds of the Mississippi Valley* (1883); *Missouri, a Bone of Contention* (1888); *Prehistoric Remains of Kentucky* (with N. S. Shaler).

CARRACI: see Caracci.

CARRACK, n. *kăr'ăk* [OF. *carraque*—from mid. L. *carrĭcă*, a ship of burden—from L. *carrus*, a car]: in *OE.*, a ship of burden.

CARRAGEEN, or Carageen, n. *kăr-ra-gēn'*, or Carrigeen' [Ir.], often incorrectly called Carrageen Moss, or Irish Moss: a sea-weed (nat. ord. *Algæ;* sub-order, *Ceramiaceæ*), or rather several species of sea-weed, now used to a considerable extent both medicinally and as food. The use of these sea-weeds appears to have been entirely confined to the peasantry of the coasts of Ireland, until about 30 years since. They are found also on the rocky sea-shores of most parts of Europe, and of the e. coasts of N. America. The species which principally constitutes the carrageen of commerce is *Chondrus crispus*, of which the varieties are remarkably numerous. It is 2–12 inches long, branched by repeated forking cartilaginous, flexible, reddish-brown. *C. mamillosus* also

frequently occurs. C., after being collected, is washed,

Carrageen (*Chondrus crispus.*)

bleached by exposure to the sun, dried, and packed up for the market. Its composition is as follows:

Vegetable jelly (carrageenin)	79·1
Mucus	9·5
Two resins	0·7
Ash	2·0
Fibre and water	8·7
	100·0

When treated for ten minutes with cold water, in the proportion of half an ounce of C. to three pints of water, and then boiled and strained, it yields, with or without spices, a very pleasant drink. With a larger proportion of C., a thickish liquid or *mucilage* is obtained; and on boiling down this strong decoction, and cooling, a stiff *jelly* is procured. Milk may be used, instead of water, in the various decoctions; and with the stronger one, with sugar and spices, when thrown into a mold, a kind of *blanc mange* is obtained. C. is valued for its emollient and demulcent properties, and is likely to be found useful in most of those cases in which iodine might be exhibited; but its value seems to depend not a little on its being at once nutritious, a pleasant article of food, and easy of digestion. See GELATINE. It has been much recommended in pulmonary consumption. In some parts of Ireland, C. boiled with water (mucilage) is used instead of size for mixing with the more common colors in house-painting.

CARRAPA'TO: species of Tick (q.v.), of the genus *Ixodes*, which infests dry, bushy places in the interior of Brazil, hanging in clusters of many hundreds on very slender twigs, and ready to attach itself to any quadruped or man that passes, instantly burying its beak in the skin, from which it cannot be detached without considerable force. Horses and oxen suffer much from the attacks of the C., of which in dry seasons the numbers are so great that whole herds of cattle are destroyed by the exhaustion which they produce.

CARRARA, *kâr-râ'râ:* town of n. Italy, 60 m. s.w. of Modena; on the Avenza, near its mouth in the Mediterranean, and surrounded by the marble hills which have made its celebrity. Many of the principal buildings are wholly or partially built of the inferior kinds of white marble. There are over 600 marble quarries in the town and vicinity. Hundreds of thousands of tons are hewn annually in the C. quarries, which have been worked since the first century B.C. The most modern appliances for rapid and accurate hewing of the stone in large and small blocks are now in use. Pop. 21,104; the commune 42,097.

The famous CARRARA MARBLE is a white saccharine limestone, valuable to the sculptor from its texture and purity. It was formerly supposed to belong to the primitive rocks, but is now known to be a limestone of the oolitic period, highly altered by plutonic action.

CARREL, *kâ-rĕl'*, ARMAND: 1800-1836, July 24; b. Rouen: French publicist and republican leader. He was educated in the military school of St. Cyr, and after serving for some years in the army he went to Paris, and gave attention to political and historical studies. In 1830, in connection with Thiers and Mignet, he became editor of the *National*, the most spirited and able of the journals opposed to the government of Charles X. C.'s colleagues being employed by the new government, he was left to conduct the *National* himself, which he did with a spirit and a freedom such as had not been seen in France for a long time—which on more than one occasion checked the arbitary power assumed by government, and gained for him popular admiration and esteem. Government prosecutions, of course, followed, and heavy fines were decreed against him; but these were paid by public subscription, and each conviction only made his journal more famous. C., however, dreaded revolution as much as he hated despotism, and had no sympathy with many of those who looked up to him as a leader. Provoked into a duel with Emile de Girardin, by an attack on his personal character, C. was mortally wounded. Littré and Paulin edited his *Oeuvres Politiques et Littéraires* (5 vols., Paris, 1857-58).

CARRIAGE, n. *kăr'ĭj* [mid. L. *carrig'ĭŭm*, a loaded cart a baggage-wagon—from L. *carrus*, a cart: OF. *carier*, to carry—from *car*, a cart, a car: F. *carrosse*, a conveyance with springs—from it. carrozza, a coach]: the act of carrying or conveying; the thing that carries; any vehicle with springs; a coach (see COACH: CART: WAGON), the charge or cost of conveyance of goods; behavior or conduct; deportment; in *OE.*, management; practice; baggage. CARRIAGE-COUPLING, n., that part of a carriage which unites the fore and hind carriages, called the perch or reach. In

many modern carriages it is dispensed with, the bed resting on the fore and hind carriages, forming the only coupling. In wagons the coupling is a pole, whose forward end is held by the king-bolt in the fore-carriage; the hind end passes through an opening between the hind axle and bolster, and the hounds of the hind axle are fastened to the pole by a pin; *secondly*, a means of uniting the bed to the fore-carriage. It usually consists of a king-bolt, which forms the pintle on which the fore carriage turns, and the fifth wheel, which is bolted to keep the portions from bouncing apart. CARRIAGE-JACK, a lever-jack, designed to raise the axle so as to lift the carriage off the ground for the purpose of removing the wheel from the spindle for repair or greasing. CARRIAGE-TOP, the cover of a carriage—permanent in coaches; double calash in barouches and landaus; calash in some gigs, buggies, phaetons, etc.; curtained in ambulances and spring-wagons; also the shifting-rail on the back and ends of a buggy-seat.—SYN.: vehicle; coach; burden; conveyance; behavior; conduct; deportment; gait; walk.

The various wheeled vehicles that may be grouped under the name 'carriage' embrace a wide nomenclature, the best known being here grouped:

Auto-carriage, an automobile carriage. See AUTOMOBILE.

Barouche, a four-wheeled, falling-top carriage, with low body, two inside seats facing, and an outer driver's seat.

Berlin, a four-wheeled covered carriage having a rear seat behind the body.

Britzska, or *Breet*, a four-wheeled Russian carriage with falling top and a rear seat uncovered.

Brougham, a four-wheeled covered carriage with outer driver's seat, and the fore body cut under so as to turn short. The *miniature brougham* seats only two.

Buckboard,a very simple form of carriage, in which a springboard or boards take the place of the springs, the seat being placed in the centre of the springboard.

Buggy, a light carriage with either two or four wheels and with or without a top.

Cab (short for *cabriolet*, but of more general meaning), a carriage licensed to carry passengers for hire, usually closed, with an outer driver's seat.

Cabriolet, a two-wheeled (later four-wheeled), two-seated, covered carriage with falling top.

Calash, or *Calêche*, a two-wheeled carriage with a falling or folding top, a seat for two passengers, and a narrow seat on the dashboard for the driver; much used in Canada. The top itself is also called a calash.

Car, (1) a railway carriage; (2) a carriage of unusual magnificence, as for use in a procession; (3) a van; (4) one of various special forms of vehicle, as the Irish jaunting-car.

Cariole, a small, light, open carriage, somewhat resembling the calash.

Carryall, a four-wheeled covered carriage, light and commodious, having two or more seats.

Cart, (1) a two-wheeled, light, topless, pleasure vehicle (2) a heavy two-wheeled springless vehicle, with a strong box, for carrying rough material.

Chaise, originally a two-wheeled, one-horse vehicle with a top, the body being hung on straps; later, a light, topless, four-wheeled carriage of varying construction.

Chariot, the early two-wheeled war-carriage; also a light 18th-century coach, with one inner seat and a driver's seat.

Coach, a four-wheeled covered carriage of large size, having two or more inner seats and one or more outside—a tally-ho; also, a two-seated four-wheeled cab, or large hack.

Coupé, a four-wheeled carriage, low-bodied, with an outer driver's seat.

Curricle, a simple form of two-wheeled two-horse carriage.

Dog-cart, a light pleasure cart with back-to-back seats, the rear seat covering a box to carry a dog or dogs.

Drag, a form of coach or tally-ho, sometimes uncovered.

Drosky, a long-bodied, four-wheeled Russian carriage. In its primitive form the body is a plank on which the passengers ride astride; also, in some European cities, a public hack.

Fiacre, the French name for a public cab.

Gig, a very light, small-bodied, two-wheeled, one-horse vehicle, with seat for one.

Hack, a hackney coach; loosely, any cab.

Hackney Coach, a four-wheeled coach kept for hire.

Hansom, or *Hansom Cab*, a two-wheeled, low-bodied, one-horse, covered carriage, having a single seat, closed in with front doors, and seat for the driver behind.

Jaunting-Car, a light two-wheeled, sometimes four-wheeled, vehicle having a perch in front for the driver, and longitudinal seats extended over the wheels, and a well between them for baggage.

Landau, a coach-like vehicle having a top, the forward part of which is removable and the rear part folding.

Landaulet, a one-seated landau.

Omnibus, a four-wheeled covered carriage with long body, seats running longitudinally, a rear door with steps; often with seats on the roof.

Phaeton, a light pleasure carriage of varying construction, usually low-bodied.

Rockaway, a four-wheeled pleasure carriage with two seats and permanent top.

Sociable, a four-wheeled topless pleasure carriage, with facing seats.

Stage, a four-wheeled carriage of large size, with several seats inside and on top, for long journeys; called also stage coach; loosely, an omnibus.

Sulky, a two-wheeled carriage, of skeleton construction, with a seat for one directly on the shafts.

Surrey, a light four-wheeled box carriage with two seats, and often side-bars.

Tally-ho, a four-in-hand coach.

T Cart, a pleasure cart having a T-shaped body.

Trap, a pleasure carriage; a term used very loosely.

Van, a very large covered wagon for conveying bulky articles, as furniture.

Victoria, a four-wheeled carriage with falling top, a seat in the body for two, and an elevated driver's seat cut under.

Wagon, a heavy four-wheeled vehicle, usually with rectangular box, for carrying goods, sometimes with removable seats, and often with removable top.

Wagonette, a light wagon for pleasure riding, with longitudinal seats facing each other, and entered by steps and a door in the rear.

To these might be added many more compound names, as top-buggy, box-buggy, post-chaise, etc. It is difficult sometimes to draw the line of distinction absolutely between many of the forms of carriages here named. Even the very common names of 'coach' and 'cab' overlap in use, that which one would call a cab in one part of the country being known as a coach in some other section.

CARRICAL, or KARIKAL, *kâr-rē-kâl':* French port within the limits of Tanjore, a dist. of the presidency of Madras; lat. 10° 55′ n., long. 79° 53′ e., on the estuary of a small branch of the Cauvery, a tributary of the Bay of Bengal. Carrical is accessible from the sea only after the periodical rains, and then only for coasting craft. The town and territory contain 63 sq. m. The settlement, originally ceded to France by a native grant 1759, and subsequently subdued by the British, was restored 1814, on condition of being neither fortified nor garrisoned. Pop., town and territory, abt. 50,000.

CARRICKFERGUS, *kăr-rĭk-fėr'gŭs:* seaport town of Ireland, on the Lough of Belfast, about 10 m. from the town of Belfast. Though locally within the county of Antrim, it forms a county of itself. Carrical extends nearly a mile along the n.w. shore of the Lough. Its chief feature is its castle, a fine picturesque object, supposed to have been erected by De Courcy in the 12th c. It is on a rock about 30 ft. high, projecting boldly into the sea, by which it is surrounded on three sides. The ballium or keep is 90 ft. in height. From the top of the keep a splendid view is obtained, extending, in a clear atmosphere, to the Mourne Mountains and the Scotch coast. The castle contains a barrack, bomb-proof magazine, and ordnance store-rooms; and for many years 22 pieces of ordnance, 12-pounders, were mounted on the works. A total change has, however, been made in the defense of the castle, and cannon of a very large calibre are now mounted, in order to command the entrance of the Lough. In 1575, a wall 16 ft. high and 7 thick, with 7 bastions, to surround the town, was commenced, and completed in 1608; a con-

siderable portion is still standing, and one of the four entrance-gates. In 1690, June 14, King William III. landed here with his army, 17 days before the battle of the Boyne. The rock on which the king stepped on landing is at the end of the quay, projecting from it, and still forming the landing-place. In 1760, Commodore Thurot captured the castle, but, on the approach of troops from Belfast, was forced to abandon it. The parish church, said to have been founded 1164, on the site of a pagan temple, is a fine old building, dedicated to St. Nicholas. A fine model school has been erected by the national board. There is a literary and scientific soc., with reading-room, library, and museum. The fishery of the bay, which is famous for oysters of an unusual size, employs many of the inhabitants. There are four spinning-mills, one for weaving linen, one bleaching establishment, a starch manufactory and a tan-yard. A market is held every Monday and Saturday, and a fair twice a year. There are several tumuli in the vicinity. Carrickfergus is connected by railway with Belfast, Portrush, and Larne. Carrickfergus is a county of itself abt. 5 m. square. Pop. of co. 8,923; of town 4,212.

CARRICK-ON-SUIR, *kăr′rĭk-ŏn-shūr:* town of Tipperary, Ireland, on the Suir, which is navigable at this point, 12 m. e. of Clonmel, in the midst of very fine scenery. Carrick was formerly celebrated for its woolen manufacture, which has recently been considerably revived, and there are also linen and flax factories. It exports much agricultural produce. The town has recently much improved. Carrick became a place of note soon after the Norman conquest. There are the remains of a castle built 1309, on the site of an old priory of the Knights of St. John of Jerusalem. Pop. (1881) 6,583.

CARRICK'S FORD, *kăr′rĭks fōrd:* scene of one of the minor battles of the war of secession, 1861, July 13, on Cheat river, Va. The Federal force under Gen. T. A. Morris defeated the Confederate force under Gen. R. B. Garnett.

CARRIER, n. *kăr′rĭ-ėr:* see under Carry.

CARRIER, *kâ-re-ā′*, Jean Baptiste: one of the most infamous members of the French national convention: 1756–1794, Dec. 16; b. at the village of Yolai, near Aurillac, in Haut-Auvergne. Entering the national convention 1792, he was active in the formation of the revolutionary tribunal, voted for the death of the king, demanded the arrest of the Duke of Orleans, and assisted in the overthrow of the Girondists. At Nantes, whither he was sent on a mission against the moderates, 1793, Oct., he found ample means for indulging his insatiable thirst for human blood. The utter defeat of the Vendeans had filled the prisons with captives, and Carrier proposed and carried a resolution for murdering the unhappy prisoners *en masse*. Accordingly, Nov. 15, he compelled 94 priests to embark in a vessel, under pretense of deportation, and during the

night drowned the whole of them, by having the ship scuttled. Another of these *Noyades*, at they were called, in which 138 persons were sacrificed, took place soon after and they were repeated to the number of 25, their perpetrators facetiously terming them 'vertical deportations.' Other cruelties Carrier committed here. Men and women were tied together feet and hands, and thrown into the Loire; and this was called *mariage republicain* (republican marriage). With such recklessness were these murders committed, that, in one instance, a number of foreign war-prisoners were drowned by mistake. The water of the Loire was so poisoned by corpses, that its use for drinking and cooking was prohibited. 500 political prisoners were shot, as in a battue, on the bridge near Nantes. Even Robespierre was offended by these enormities, and recalled Carrier, who boldly justified his own conduct before the convention. The fall of Robespierre was, however, soon followed by outcries against Carrier; judgment was decreed against him, and he perished under the guillotine—dying with the protestation that, in all his cruelties, he had acted according to orders, and as a true republican patriot.

CARRIER PIGEON: variety of the domestic pigeon (q.v.), remarkable for the degree in which it possesses the instinct and power of returning from a distance to its accustomed home; therefore, much employed to convey letters from one place to another. In eastern countries, where such messengers are most frequently employed, it is the practice to bathe the pigeon's feet in vinegar to keep them cool, and to prevent it from alighting in quest of water, by which the letter might sustain injury. Pigeons intended for this use must be brought from the place to which they are to return within a short period, not exceeding a fortnight of their being let loose, and at a time when they have young in their nest, the remarkable fecundity of the Carrier Pigeon affording particular facilities for its employment in this way. The bird is also kept in the dark and without food for at least eight hours before being let loose. The instinct by which it is guided, like most other instincts, has received no sufficient explanation. That it recognizes objects by sight, and so directs its course, is nothing more than a conjecture, and as such is only partially supported by the fact of the great power of vision which these birds, in common with many others, are known to possess, and by the fact that the carrier pigeon, on being let loose, immediately rises spirally to a great height in the air, as if to obtain opportunity for the exercise of this power. The carrier pigeon has probably been used in the Turkish dominions more than in any other part of the world, and during the siege of Paris, 1871, it safely conveyed many important messages. Its rate of flight is not less than 30 miles an hour, and it has been known to pass over great distances still more rapidly. The variety generally described as the carrier pigeon (*Columba tabellaria* of Linnæus, *C. Turcica* of some authors, but not generally regarded by naturalists as a distinct species) is of

remarkably large size, about 15 inches in length from the point of the bill to the extremity of the tail; and has the cere very large and carunculated, the eyes surrounded with a broad circle of naked red skin, and the wings reaching nearly to the extremity of the tail. There is, however, a smaller variety, said to be superior, which has not the carunculated cere, nor the broad circle around the eye.

CARRIERA, Rosalba, Italian painter: b. Venice 1675; d. 1757. She is chiefly known by her portraits in crayon. In 1705 she became a member of the Academy of St. Luke in Rome, and in 1720 of the Acadamy of Bologna. She visited Paris in 1720 and painted portraits of King Louis XV. and members of the court. She was elected a member of the French Academy and in 1721 returned to Venice. She was a great worker and toward the end of her life became blind from overwork. There are 143 of her drawings in the gallery in Dresden, and the Louvre, Uffizi, and St. Petersburg galleries possess others.

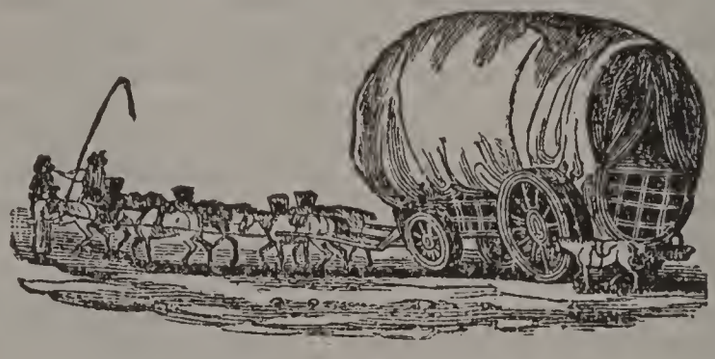
CARRIÈRE, Moritz: German author: b. Griedel, Hesse, 1817, March 5; d. Munich, 1895, Jan 19. He studied philosophy at Giessen, Göttingen, Berlin, and in Italy. In 1849 he became professor of philosophy at Giessen and after 1853 held that position at Munich. He was a defender of Christianity, opposed Ultramontanism, and was of the liberal school. He also took high rank as an art critic. Among his published works are: *Der Kölner Dom als freie deutsche Kirche* (1843); *Abälard und Heloise* (1844); *Die Religion in ihrem Begriff* (1841); *Die philosophische Weltanschauung der Reformationszeit* (1847); *Das Charakterbild Cromwells* (1851); *Die Kunst im Zusammenhang der Kulturentwickelung und die Ideale der Menschheit* (1863–71); *Geschmack und Gewissen* (1882). His *Gesammelte Werke*, 13 vols., appeared in Leipzig in 1886–91.

CARRIER-BELLEUSE, Albert Ernest, *âl-bâr ėr-nā kâ-rē-â-bĕl-lėrz*, French sculptor: b. Anizy-le-Chateau 1824, June 12; d. Paris 1887, June 3. He was a pupil of David d'Angers, and while studying was compelled to earn his living by making models for the manufacturers of bronzes. Toward the close of his life he was director of the porcelain works at Sèvres. His works include marble sculptures and terra-cotta busts; among them are *Angelica; Madonna and Child* (in the Church of St. Vincent de Paul in Paris); *Sleeping Hebe; Forsaken Psyche;* and a number of busts of remarkable truthfulness to life.

CARRIÈRES, Louis de, French theologian of the Rom. Cath. Church: b. Cluvilé 1662; d. Paris 1717, June 11. In 1689 joined the Congregation of the Oratory and became well known as a theologian. At the request of Bousset he published a *Commentaire Littéral* (24 vols. 1701–16), reprinted Paris 1872.

CARRIER SHELL, or Mason Shell: a gastropod mollusk of the genus *Phorus*, which covers its shell with grains of sand, shell, coral, etc. These bits are fastened by an exudation from the mantle, and are apparently protective in their purpose.

CAR'RIERS: class of persons who, in various forms, by land and sea, undertake the carrying of goods, particularly articles of commerce. The business is known as the CARRYING TRADE. The method of carrying in Arabia, Persia, and some other countries in the east has, till the present time, been chiefly by means of the camel: see CAMEL. In England and Scotland, previous to the general use of wheel-carriages, goods were carried on pack-horses, as is still practiced in some parts of Spain with mules: see PACK-HORSE: MULE. After the pack-horse came the one-horse cart and the four-wheeled wagon, as engines of land conveyance. Carrying with one-horse carts at the rate of about 20 m. daily, was the common practice in Scotland, and is so still in districts not traversed by railways. In connection with Edinburgh, Glasgow, and other centres of traffic, the Scotch C. travel to and from provincial towns for the most part once a week on certain days, so that their arrival at any particular place may be reckoned on with exactness. In England, the carriers' wagons are still to be seen in some rural districts. A wagon of this kind has four broad, huge wheels; and, being a heavy and clumsy engine of conveyance, is drawn



Covered English Wagon.

by four horses, though, when roads were bad in old times, six horses were not unusual. The driver ordinarily rode on a pony alongside the vehicle; now he more frequently walks, carrying a long whip. The wagon has a hooped top with movable covering, and the rear part has always been left vacant for passengers, who are necessarily huddled together on straw. Travelling in the 'tail of the wagon,' now seldom seen, was common till past the middle of the 18th c., and has afforded scope for some of the most grotesque descriptions of Fielding and Smollett. The tedious process of carriage by these wagons largely increased the prices of goods, and retarded commerce. The first modification in the carrying trade was by means of inland navigation: see CANAL. The chief owners of the old wagons became, in time, chief owners of the canal-boats; they paid rates or tolls to the canal companies The celebrated English firm of Pickford & Co. has been for many generations, and still is, at the head of the goods-carrying trade.

When railways were established, a great struggle ensued; the owners of the road-wagons and canal-barges had a formidable competition They wisely accommo-

dated themselves to a state of things which they could not prevent, and added the trade of railway goods C. to their former business. In Great Britain three systems were tried: 1. The railway company purchased road-wagons or vans, collected goods at the various towns, conveyed them by railway, and then distributed them at their several destinations. 2. The company confined their attention to the mere conveyance on their railway, leaving the collection and delivery to the ordinary carriers. 3. The company combined both systems, conveying on the railway everything that offered, and competing with the C. for the road-traffic. During the greater portion of the period in which the railway system has been in operation, the second of the above three plans has been adopted more extensively than either of the others. Taking as examples the greatest railway company and the greatest carrying firm, Messrs. Pickford had warehouses or depots at all the principal towns where the London and Northwestern railway had stations. The merchants and manufacturers were customers, not to the company, but to the firm, for the conveyance of merchandise. Messrs. Pickford employed their own wagons and horses, clerks and porters, in collecting and delivering goods, and paid to the company so much per ton for the conveyance along the railway, the toll varying according to the nature of the goods and the distance run. There were seldom any quarrels or disputes under this system. The carrier was responsible to the customer from first to last for the safety of the merchandise; and he had a claim against the company for any injury while the merchandise was on the railway. Under the third system, disputes were much more frequent.

At the present time, the tendency in Britain is for the companies to take the responsibility of the whole conveyance, the C. acting as their agents, if willing so to do, or else endeavoring to maintain a fair competition. The goods vans traversing the streets of London and other great towns, are now more frequently inscribed with the names of railway companies than with those of private carriers. The introduction of the parcel-post system (1883) brings increase to the carrying trade.

The goods depots of the several railways are scenes of great activity during the night; for it is then that the goods arriving or departing are sorted for sending or for delivery. Canals still command a carrying trade, but chiefly in coal, stone, lime, ores, slate, bricks, and other articles bulky in proportion to value. The conveyance of manufactured goods has, for the most part, passed over to the railways.

In towns, there are C. whose business is confined wholly to short distances—a traffic which no amount of railway extension would wholly accommodate. For London an excellent system has been established by the 'London Parcels Delivery Company.' Two or three times a day parcels are conveyed from receiving-houses all over the metropolis to a central depot near Fetter Lane, there sorted, and sent out again for delivery. The metropolis, out to a wide distance,

is separated into districts, and one or more carts, filled with parcels, are sent to each district at certain hours of the day. The speed is rapid, the times are punctual, and the service in general well conducted.

The term CARRYING TRADE has latterly been applied more especially to all kinds of conveyance of merchandise by sea, whether across the ocean or along the coast. In this broad view, it, in reality, involves the whole question of mercantile marine, British and foreign.

CARRIERS, LAW RESPECTING. A carrier in law is one who offers to the public to convey passengers, or goods, from one place to another, for hire. The offer must be general —for a private person who contracts with another for carriage, is not a carrier in the legal sense, and does not incur the peculiar responsibilities which, in almost every country, it has been found expedient to attach to the occupation of a public or common carrier. Carriage, in law, is thus a peculiar modification of the contract of hiring. In Rome, the responsibilities of carriers by water were regulated by a pretorian edict, which was applicable also to innkeepers and stablers (Nautæ, Caupones, Stabularii, Dig.; lib. iv. t. 9); and from that edict the law of carriage in modern Europe has been mainly borrowed, sometimes directly, as in Scotland, sometimes indirectly, as in England. The ground on which the edict increased the responsibilities attaching to an ordinary contract of hiring was, that the persons whom it enumerated were under peculiar temptations to consort, either personally or through their servants, with thieves and robbers, without the connection being such as to admit of proof; and that the public safety consequently required that they should be held responsible for whatever had been intrusted to them, till its safe delivery at the place to which they had undertaken to convey it. This responsibility in common law extends not only to the acts of the carrier's servants, but also to those of the other guests in an an inn, or the other passengers in a conveyance. The only exception to this liability at common law is in the case of loss arising from the act of God (q.v.) or the queen's enemies—i.e., the fury of the elements, or war. There are, however, some reasonable statutory limitations. The decisions of the courts also have somewhat limited the universal responsibility of the carrier. For example, it has been decided that he is not liable, *qua* C. (and the same applies to an innkeeper), for money taken from the pockets of the traveller; but that, if the money has been taken from the pockets of clothes which have been stolen, or from trunks which have been broken into, his responsibility comes into operation.

Under C. are included carters and porters, who offer themselves for hire, to carry goods from one part of a city to another. Whether the same be the case with hackney-coachmen is not settled; though, from the extent to which they are now employed in the transport of luggage, there seems no sound reason for an exemption in their case. Wharfingers and warehousemen are liable only under the special contracts into which they may have entered, or in

accordance with mercantile usage. In England, it has been decided that lodging-house keepers are in a different position from carriers and innkeepers, on the ground that they do not profess to entertain all comers, or to receive their goods. Carriers are liable to make good to the owners of goods intrusted to them all losses arising from accidental fire. Carriers have a lien upon the goods they have carried for payment of the carriage only. The lien is, however, restricted to the particular goods to which the carriage refers, and ceases on possession of them having been given up. It does not cover any account or balance due by either the sender or consignee to the carrier.

United States.—Here the definition of a carrier, or common carrier, in the meaning of the law differs but slightly from that of the English law; it describes him as one whose 'business, occupation, or regular calling it is to carry chattels for all persons who may choose to employ and remunerate him.' The occupation includes stage-coach proprietors, railway companies, truckmen, wagoners and teamsters, carmen, and porters; and express companies whether these be local, interstate, or international (see INTERSTATE TRAFFIC). There are also included the owners and masters of every kind of vessel or water craft who undertake to carry freight for hire for the general public, and this, regardless of distance, and including lake and river, coastwise, and ocean navigation. The question has, however, been raised in law, whether carmen and coasters are common carriers, and there are arguments pro and con. The liability of the owner of a tug-boat to his tow is not that of a common carrier. Meanwhile, one who undertakes transportation only as a forwarder is considered a common carrier, and he is liable uunder the law.

Common carriers are, it is usually laid down in the boot responsible for all loss or damage during transportation, from whatever cause, except the act of God or the public enemy; the former case of immunity being considered to extend only to such inevitable accidents as occur without the intervention of man's agency, and which could not be avoided by the exercise of due skill and care. But to be more exact the carrier's exemptions from his insurance or absolute liability are five, viz—(1) the act of God (2) the public enemy (3) inherent defects, quality or vice in the thing carried (4) seizures of the thing carried under legal process (5) the act or omission of the owner or shipper of the goods. Carriers, both by land and by water, are bound to carry all goods offered; and if they refuse, without just excuse, are liable to an action. But the business may be restricted within such limits as are deemed expedient, and the carrier is not bound to accept goods out of the line of his usual business, though after having received such goods, except in the case of special contract, he is liable under the general law. Live-stock is generally carried under special contract, but where this is not the case the carrier who accepts live-stock for transporta-

tion is liable under the law of a common carrier. Special contracts may be made by carriers and are binding, as to terms, times of delivery, responsibility for damage, etc., but a carrier cannot contract against his own negligence or the negligence of his employees or agents.

Railway companies, steam-boats, and other carriers allowing express companies to carry parcels and packages on their cars, boats, or other vehicles, are liable as common carriers to the owners of goods for all loss or damage which occurs, without regard to the contract between them and such express carriers. They are responsible also to passengers for baggage intrusted to them as common carriers, such responsibility continuing for a reasonable time after the goods have been placed in the warehouse or depot of the carrier, at the place of destination, for delivery to the passenger or his order. And where one company checks baggage through a succession of lines owned by different companies, each company becomes responsible for the whole route, the baggage-checks standing in the place of a bill of lading, and being *prima facie* evidence of the liability of the company giving it. Money, however, except a reasonable amount for expenses, is not properly baggage. The responsibility of a carrier terminates after the arrival of the goods at their destination, and when a reasonable time has elapsed for the owner to receive them in business hours. Agents of corporations who are common carriers, such as railway and steam-boat companies, will bind their principals to the full extent of the business intrusted to their control, whether they follow their instructions or not. The carrier has an insurable interest in the goods that he carries, in regard both to fire and to marine disasters, measured by the extent of his liability for loss or damage. In a general way, the liability of a carrier, where the goods are not delivered through his default, is to the extent of their market value at the place of their destination. If the goods are only damaged, or not delivered in time, the owner is bound to receive them. He will be entitled to damages, but cannot repudiate the goods and recover from the carrier as for a total loss.

Common carriers of passengers are such as undertake to carry all persons, indifferently, who may apply for passage so long as there is room and there is no legal excuse for refusing. Passengers may be excluded for cause, as being drunk and disorderly, affected with a contagious disease, or designing to commit a crime, flee from justice, gamble or interfere with the proper regulations, and disturb the comfort of the passengers. A company owning palace and sleeping cars, who enter into no contract of carriage with the passenger, but only give him superior accommodations during the journey, is not a common carrier. Passenger carriers are not held responsible for the safety of their passengers, as common carriers of goods are, though they are bound to exercise the greatest care and watchfulness in regard to all the appliances for the

conduct of their business. The fact of riding on a pass, or of not having paid fare, does not excuse the carrier for negligence. Where an injury to a passenger results directly from the passenger's own negligence, the carrier is not responsible. But, negligence being proven upon the carrier, he is responsible to passengers for loss or injury. Passenger-carriers may establish reasonable regulations in regard to the conduct of passengers, and these must be acceded to on the part of passengers. But, as has been stated, these do not extend to limitation of liability in the case of travelling on a pass; nor do the words 'good this trip only' on a ticket limit the undertaking of a company to any particular day or any specific train. There are many special regulations comprised in statutes and ordinances governing common carriers, both by land and by water, but these can be learned only through examination of the laws of the different states, the United States revised statues, and corporation ordinances of cities and towns.

CARRINGTON, *kăr'ĭng-tŭn* Henry Beebee, American lawyer, soldier and historian: b. Wallingford, Conn., 1824, March 2. He graduated at Yale in 1845; taught at Tarrytown, N. Y., 1846 and at Yale Law School 1847; began the practice of law in Columbus, Ohio, in 1848, and took an active part in the anti-slavery movement. In 1857, he was Adjutant-General on the staff of Gov. Chase and organized the State militia in preparation for war. In 1861 he was appointed colonel of the 18th United States infantry, served through the Civil War, and afterward was in service on the plains; was wounded in war with Sioux Indians and retired in 1870; he became professor of military science and tactics in Wabash College, Ind., a position which he held till 1873. He has written: *Russia as a Nation; American Classics; Ad-sa-ra-ka, Land of Massacre*; *Battles of the American Revolution; Washington the Soldier*; and other works.

CARRINGTON, Paul American statesman: b. Charlotte County, Va., 1733, Feb. 24; d. 1818, June 22. He was graduated at the College of William and Mary. During the Revolution he was a member of various conventions and of the Committee of Safety; opposed the Stamp-Act resolutions of Patrick Henry; became a member of the court of appeals, and in the Virginia convention voted for the adoption of the Federal Constitution.

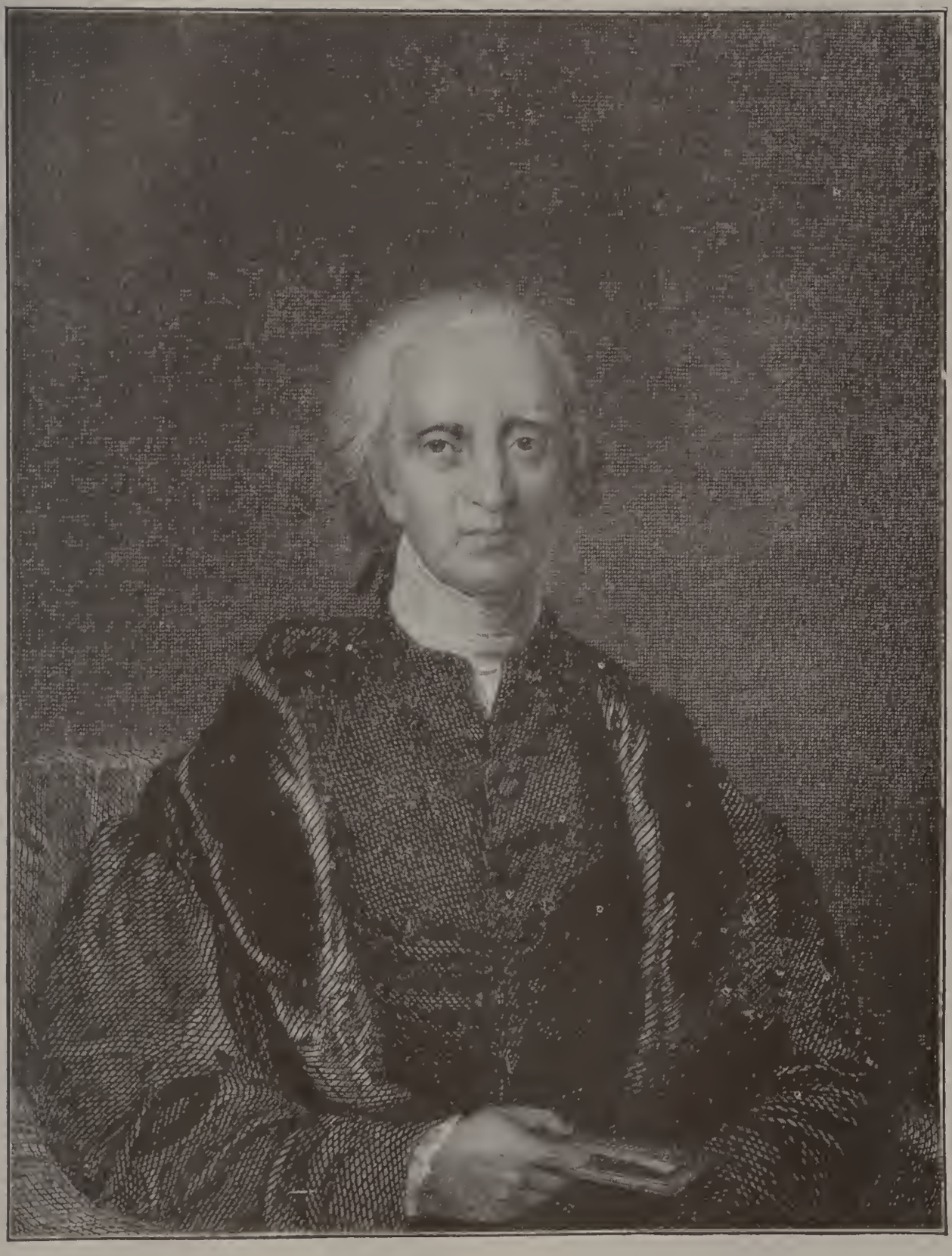
CARRINGTON, Richard, English astronomer: b. Chelsea, 1826, May 26; d. 1875, November. Carrington entered Trinity College, Cambridge, in 1844, to prepare for the Church, but his scientific tendencies being awakened by the lectures of Prof. Challis he turned his attention to astronomy. He held the post of observer at the University of Durham from 1849 to 1852. He was elected a Fellow of the Royal Society (1860 June 7). His work *Observations on the Spots on the Sun* (1863) furnished data that materially affected the study of solar physics.

CARRIOLE: see CARIOLE.

CARRION, n. *kăr′rĭ-ŏn* [OF. *caroigne* or *charoigne*, a carcass—from mid. L. *carōnĭă*—from L. *carnem*, flesh: It. *carogna;* F. *charogne*, carrion]: tainted or putrid flesh; flesh unfit for human food: ADJ. relating to; feeding upon tainted or putrid flesh. CARRION CROW, a species of crow common in England which feeds on carrion, insects, etc. (see CROW); in the United States carrion-crow or black vulture is the name not of a species of crow, but of one of the vulture family (see VULTURE). CARRION-FLOWER, a. s. African plant having a fetid and very offensive odor; the blossoms of the *Stapēlĭă*. The genus *Stapelia* belongs to the nat. ord. *Asclepiadeæ*, and is remarkable for excessive development of the cellular tissue of the stem and reduction of that of the leaves, resulting in a general aspect like that of the *Cactus* family. The species are natives of the Cape of Good Hope. The flowers are often large, and not devoid of beauty, but the carrion stench is very strong. It is not yet known to what chemical substance it is owing.

CARRI-WARRY, n. *kâr′rĭ-wâr′rĭ* [an imitative word]: in *Scot.* and *prov. Eng.*, a burlesque or mock serenade: see CHARIVARI.

CARROLL, *kăr′ul*, CHARLES OF CARROLLTON: 1737, Sep. 20—1832, Nov. 14: patriot: b. Annapolis, Md. His ancestors emigrated in the reign of William and Mary; the family was of Rom. Cath. faith. Carroll was educated at the Jesuit colleges of St. Omer, 1745–51, and Rheims, 1751–67; studied law at Bourges, Paris, and London; returned to America 1764, and married Mary Darnell 1768. He inherited the last of the Md. manorial grants, an estate valued at some two million dollars, and in 1775 was considered the richest man in America. As 'First Citizen,' he wrote, 1770–1, against the right of govt. to regulate fees by proclamation. He was a member of the first committee of observation at Annapolis 1775, and a delegate to the provincial convention. 1776, Feb., he went with other commissioners to Canada to induce a friendly attitude toward the revolted colonies. A journal of this mission, with memoir by B. Mayer, appeared 1845. The embassy returned in June with empty hands. Meanwhile the Md. deputies to the continental congress had been instructed to 'disavow all design in the colonies of independence.' He hastened to Annapolis and procured the withdrawal of this order. Appointed delegate to congress July 4, he signed the Declaration with others Aug. 2. As he did so, a colleague remarked: 'There go several millions,' and added, 'but there are other Charles Carrolls, and the British will not know which it is;' whereupon Carroll added 'of Carrollton,' which words have kept their place as part of his name. He served on the board of war, and on the committee which drafted the Md. constitution; was elected to congress again 1777, to the Md. senate 1776, 1781, 1786, 1797, and to the United States senate 1789. He was a commissioner to settle the Va. boundary, 1799. In 1810 he



CHARLES CARROLL.

retired from public life. In his 91st year, 1828, July 4, he laid the corner-stone of the Baltimore and Ohio railroad. He was greatly respected for his character, attainments, and services, and during his last six years was an object of peculiar interest as the only surviving signer of the Declaration.

CARROLL, Henry King, American clergyman and editor: b. Dennisville, N.J. 1848, Nov. 15. He was on the staff of *Hearth and Home* (Methodist), and from 1876 to 1898 was religious and political editor of the *Independent.* He has written *The Religious Forces of the United States;* and many reviews, reports, and miscellaneous papers. He supervised the compilation of religious statistics for the 11th census, and in 1898 was appointed to prepare a report on the internal conditions of Porto Rico. In 1900 he became a secretary of the Methodist Episcopal Church Missionary Society.

CAR'ROLL, Howard, American journalist: b. Albany, N. Y., 1854. He began newspaper work in New York as reporter for the *Times,* of which he subsequently became special Washington correspondent. He has since held several responsible business positions and is the author of *A Mississippi Incident; Twelve Americans: Their Lives and Times;* etc.

CARROLL, John, D.D., LL.DD.: 1735, Jan. 8—1815, Dec. 3; b. Upper Marlborough, Md.: first Rom. Cath. bp. in the United States. He was educated at St. Omer's, Liege, and Bruges; was ordained priest at Liege 1769, and became a Jesuit. On the suppression of that order, he acted as its sec. in offering a remonstrance to the French court. He went to England, was travelling tutor to Lord Stourton's son 1770–73, and then prof. at Bruges. After staying with the Earl of Arundel, in England, he returned to Md. 1775, and took a parochial charge. Congress invited him, 1776, Apr. 2. to go with Franklin, S. Chase, and his cousin Charles Carroll on their Canadian mission. The Rom. Cath. clergy, desiring a hierarchy of their own after the peace, C., at Franklin's instance, was appointed vicar-gen. for America, 1786. Named bp. of Baltimore 1789, he was consecrated in England 1790, and created abp. 1815. He founded St. Mary's College, 1791, and procured a charter for Baltimore College, 1804. Carroll was tolerant, exemplary, and highly esteemed.

CARROLL, John Joseph, American Roman Catholic clergyman: b. Enniscrone, County Sligo, Ireland, 1856-June 24. He came to the Unted States in infancy, was educated in St. Michael's College, Toronto, Ontario, and at St. Joseph's Theological Seminary in Troy, N. Y. He became assistant priest in the Cathedral of the Holy Name, Chicago, in 1880, and subsequently rector of St. Thomas' Church there He is a Gælic scholar of prominence and has written *Notes and Observations on the Aryan Race and Tongue* (1894); *Prehistoric Occupation of Ireland by the Gælic Aryans;* etc.

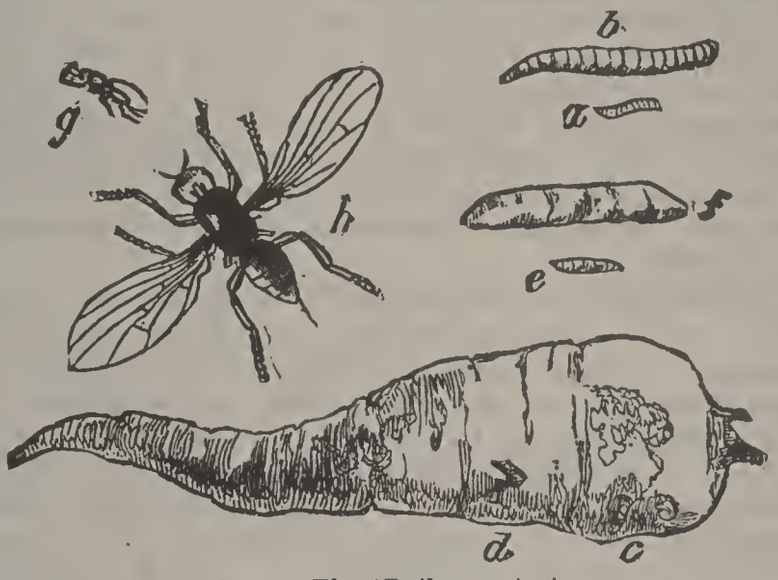
CARRONADE, n. *kăr′rŏn-ād′* [from *Carron* in Scot., where first made]: short iron gun, invented by Mr. Gascoigne. Carronades are lighter than ordinary guns, and have a chamber for powder, like mortars. They were made standard British navy guns in 1779, to be carried on the poop, forecastle, and upper works. Being manageable by a smaller number of hands than ordinary guns and being very useful in close engagements, they were held in much favor during the great war: the seamen called them 'smashers. A 68-pounder carronade weighed not much more than half as much as the 42–pounder gun in use in 1779. They range from 68-pounders down to 6-pounders. For the denominations, weights, lengths, calibre, etc., of the chief varieties, see CANNON.

Some carronade are made shorter with a given bore. Carronade are but little used, except by the English and French. Though valuable at close quarters, they are no match for long guns at a distance; and therefore a ship armed only with carronade would fare badly in a general action. In recent years carronades have to a considerable extent been replaced in the English navy by howitzers, long guns, and shell guns.

CARRON OIL: see BURNS.

CARROT, n. *kăr′rŏt* [F. *carotte*—from mid. L. and It. *carota*]: a long esculent root of a reddish color. CARROTY, a. *kăr′rŏt-ĭ*, like a carrot in color. Carrot (*Daucus*), is a genus of plants of the nat. ord. *Umbelliferæ;* natives mostly of the countries surrounding the Mediterranean Sea. The common carrot (*D. Carota*), is a biennial plant, common in the United States but not native, and in most parts of Europe, also in the Caucausus, in which countries, as also in China, Cochin China, etc., it is cultivated for the sake of its root. The root of the wild plant is slender, woody, and of a very strong flavor; that of the cultivated variety is much thicker and more fleshy, much milder in flavor and qualities, generally red, sometimes orange or yellowish white. The sub-vareties in cultivation are distinguished also by their form—some being longer and more tapering than others—by their size, and by the duration of their growth; the *early* kinds being also comparatively small, and almost exclusively cultivated in gardens for culinary use, while the larger and *late* kinds are often grown also in fields, for feeding cattle. The field cultivation of the carrot is extensive in some parts of France, Germany, and Belgium, and is increasing in Britain. The carrot appears to have been cultivated at an early period in Flanders and Germany, and to have been introduced into the gardens of England in the beginning of the 16th c. In the reign of Charles I., ladies wore carrot leaves as an ornament instead of feathers; and the beauty of the leaves is still occasionally acknowledged by placing a root, or the upper portion of one, in water that it may throw out young leaves to adorn apartments in winter. The carrot prefers a light and rather sandy

soil, and often thrives on a peat soil. It is very liable to the attacks of the larva of the crane fly (q.v.), by which the greater part of a crop is sometimes destroyed when the young roots are about the thickness of a quill; on which account, in gardens where there is particular reason to apprehend danger from this enemy, it is the practice to make a number of successive sowings, some of which may probably escape. As an article of food carrot contains a large amount of what are called heat-producing compounds, with a small proportion of flesh-forming matter. It consists essentially of starch, sugar, and albumen, with a volatile oil which communicates a flavor



Carrot Fly (*Psila rosæ*): *

a, larva, natural size; *b*, larva, magnified; *c*, *d*, its operations on the root; *e*, pupa, natural size; *f*, pupa, magnified; *g*, mature insect, natural size; *h*, mature insect, magnified.

unpleasant to many dyspeptics. The following is the composition of dried carrot:

Starch and sugar	93.71
Albumen	4.35
Red neutral substance (carotin)	0.34
Fixed and volatile oils	1.00
Ash	0.60
	100.00

Carrot is easy of digestion, and gently laxative. Boiled carrot is used as a poultice for foul ulcers and other sores, and as a vermifuge. Grated carrot forms an agreeable, cooling, but also stimulant application. A sirup is prepared from carrots; and when cut into small pieces and roasted, they are occasionally used in Germany as a substitute for coffee. A strong ardent spirit is distilled from them in some parts of Europe, ten lbs. of carrots yielding about half a pint. Carrot seeds are employed as a diuretic also as a carminative and stimulant; those of the wild carrot being preferred.—Besides the crane fly, already

*For the accompanying illustration, and many others of a similar nature throughout this work, we are indebted to Morton's *Encyclopædia of Agriculture*.

noticed, carrots have numerous other insect enemies. One of the most troublesome is the CARROT FLY (*Psila rosæ*), a small dipterous fly, the larvæ of which, by eating away the surface of the root, cause what is commonly known as *rust* in carrots, and prepare them for the further operations of millepedes and other destroyers. The larvæ of several species of moth (*Depressaria*) are very injurious to them when in flower and seed. An aphis (*A. dauci*) often kills the young plants.

CARROTIN, *kăr'rŏt-ĭn*, or CAROTIN, the coloring-matter of the carrot: Its formula is doubtful, for although carotin appears, from such analyses as have been made, to be a simple hydrocarbon, no other strongly colored hydrocarbon is known, and hence the probability is that oxygen is also an essential constituent. It may be extracted from the chopped carrot by the action of carbon disulphide, in which (as also in benzene) it is very soluble. It crystallizes in small, red plates, which are insoluble in water and in alcohol. A similar compound, called 'hydrocarotin,' is also known.

CARROUSEL, *kar-rô-zel* [Fr.]: a species of knightly exercise, which, even till the beginning of the 18th c., was common in all the courts of Europe. Carrousel was a a kind of imitation of the tournament, and for a time after the discontinuance of the latter seems to have supplied its place. The dresses, for the most part, were those of the knights of former times, and the combatants, or rather competitors, were divided into two parties, usually according to their different nationalities. One of the favorite exercises in France consisted in running at the pasteboard head of a Moor or Turk with a lance, cutting it down with a sword, or firing at it with a pistol. Another of these tests of skill and horsemanship consisted in carrying off a whole line of rings suspended for the purpose. The Carrouser in France was not known earlier than the reign of Henry IV.; but it had existed for some little time previously in Italy. There were brilliant carrousels under Louis XIII., and two celebrated ones were given in honor of Mademoiselle de la Vallière—one at Paris, 1662, the other at Versailles, 1664. The place where the first of these fêtes was held has ever since been called the Place du Carrousel. A revival of the carrousel was attempted at Berlin 1750; and in 1828 the cavalry school at Saumur held one in honor of Madame la Duchesse de Berry. The so-called Eglinton Tournament—an entertainment given in England, 1839, by the chivalrous Earl of Eglinton—was in reality a carrousel.

CARRUTH, FRANCES WESTON, American writer: b. Newton, Mass., 1867, July 12. Since 1896 she has lived in New York, engaged in literary work. In 1904 she married Harry Brown Prindle. Her published volumes include: *Those Dale Girls* (1899); *The Way of Belinda* (1900); *Fictional Rambles in and about Boston* (1902).

CARRUTH, FRED HAYDEN, American journalist: b.

Lake City, Minn., 1862, Oct. 31. He was on the editorial staff of the New York *Tribune* 1888–92, and has been more recently editor of the humorous department of Harper's Magazine. Since 1905, May, he has been on the staff of the *Woman's Home Companion.* He has published *The Adventures of Jones* (1895); *The Voyage of the Rattletrap* (1896); *Mr. Milo Bush and Other Worthies* (1899); etc.

CARRUTH, William Herbert, American scholar: b. Ossawattomie, Kan., 1859, April 5. He was educated in the University of Kansas, and at Harvard and has been professor of German in the former institution from 1887. He has published *Schiller's Wallenstein with Introduction and Notes* (1894): and other German texts similarly edited, including *Scheffel's Ekkehard* (1895); *Schiller's Wilhelm Tell* (1898); *Auswahl aus Luther's Deutschen Schriften* (1899); *Schiller's Die Braut von Messina* (1901); *Carruth's Otis' Elementary German Grammar* (1904); *Carruth's German Reader* (1904). He has also edited *Kansas in Literature* (2 vols., 1900), and translated Cornhill's *History of the People of Israel* (1898) and Gunkel's *Legends of Genesis,* etc.

CARRUTHERS, *kăr-rŭ'thėrz,* William A., American novelist: b. Virginia, about 1800; d. Savannah, Ga., about 1850. He was professionally a physician, but wrote a number of spirited romances founded on incidents in American history. His best work is *The Cavaliers of Virginia, or the Recluse of Jamestown, an Historical Romance of the Old Dominion* (1832). He is the author also of *The Knights of the Horse-Shoe* (1845).

CARRY, v. *kăr'rĭ* [F. *charrier;* OF. *carier,* to convey in a car—from OF. *car,* a cart, a car—from L. *carrus,* a car; Gael. *caraich,* to move from one place to another]: to move a thing from one place to another; to remove; to bear; to convey; to effect or accomplish; to lead or draw; to produce; to transact or conduct; in *mil.,* to obtain possession of a military position by force. Car'rying, imp. Car'ried, pp. *-rĭd.* Car'rier, n. *-rĭ-ėr,* one who. To carry away, in *naval language,* to break a spar; to part a rope. To carry it, to prevail; to gain the mastery. To carry off, to kill; to bear away; to face out. To carry on, to promote; to help forward; to continue. To carry out, fully to accomplish; to put into execution. To carry through, to succeed by perseverance. Carrier-pigeon, a variety of the pigeon, employed for carrying letters to the place where the birds have their home, which they do, from very great distances. Carry-all, n. a 4-wheeled covered family vehicle, drawn by one horse. Syn. of 'carry'; to bring; fetch; bear; convey; transport; support; sustain; exhibit; imply; contain; comprise; behave; conduct; demean; propel. See Carriers.

CARRYL, Charles Edward, American broker and author: b. New York, 1841, Dec. 30. He has been a member of the New York Stock Exchange from 1874, and has published *Davy and the Goblin,* a very popular juvenile

in the manner of *Alice in Wonderland* (1884); *The Admiral's Caravan* (1891); *The River Syndicate and Other Stories* (1899); etc.

CARRYL, Guy Wetmore, American humorous writer; b. New York, 1873, March 4; d. New York, 1904, April 1. He was a son of C. E. Carryl (q.v.), and the author of *Fables for the Frivolous* (1898); *Mother Goose for Grown-Ups* (1900); etc.

CARSE, n. *kârs* [W. *cors*, a bog]: in *Scot.*, low, fertile, alluvial land near a river, or the valley through which a river flows. The word in Stirlingshire is restricted in its sense to the level alluvial soils only a few feet above the river Forth. In Perthshire it applies to the whole of the slightly undulating lands to the north of the Tay, which form the Carse of Gowrie. Carse soils consist usually of argillaceous deposits, which produce crops of great luxuriance, although there are some which consist of barren clays. The richest are of a hazel color, and become friable when exposed to the action of frost; the poorest are of a yellow color, containing little vegetable matter to render them amenable to cultivation. The best kinds of carse soils are generally farmed on the six-course shift —1. Grass; 2. Oats; 3. Beans; 4. Wheat; 5. Potatoes; 6. Turnips or Fallow. Large crops of grass are grown when the clover-plant catches. It is mostly made into hay, and the after-math is used for soiling horses and cattle in the straw yards. The land is seldom pastured, as the feet of animals trample and destroy the grasses when the weather is wet. The oat-crop is more uncertain on the carses, but in favorable years the yield is large and the quality of the grain is excellent. Beans are very successfully grown; indeed, the best of the carse soils are the best bean-soils in Scotland. Where the land is rich, and not too stiff, the potato is sometimes largely grown. On the poorest description of the carse soils the potato does not thrive. Wheat can be grown in closer succession on the carse lands than on any other description of land with the same expenditure of manure. A large stud of horses are required on carse lands, to enable the farmers to prepare the land for the various crops at the seasonable moment.

CARSON, *kâr'son*, Christopher: 1809, Dec. 24—1868: May 23; b. in Madison co., Ky., from which his parents removed to the wilderness of Howard co., Mo., while he was an infant. He was a saddler's apprentice 1824–27, travelled extensively over the plains with a trapping expedition 1827–35, was hunter to Bent's Fort, 1835–43, and as scout accompanied Lieut. John C. Frémont on his Rocky mountain explorations. In 1847, Frémont sent him to Washington with dispatches, and while there he was appointed lieut. United States rifle corps; in 1853, he drove 6,500 head of cattle over the mountains in Cal. and on his return was appointed Indian agent in New Mex. He served through the Mexican and Civil wars, rendering

the govt. invaluable aid among the Indians and attaining the rank of brev.-brig.-gen., and at the close of the latter resumed his duties as Indian agent. In the early part of 1868 he took a deputation of Indians to Washington and then visited the principal n. and s. cities with them. 'Kit' Carson was better known by a majority of Indian tribes than any other white man, spoke their dialects freely, and had their confidence. He died at Fort Lynn, Colorado.

CARSON, Hampton Lawrence, American publicist: b. Philadelphia, Pa., 1852, Feb. 21. He was graduated at the University of Pennsylvania in 1871, and became a lawyer, rising speedily to prominence by speeches and addresses on topics of the time. He has written: *History of the Supreme Court of the United States; The Law of Criminal Conspiracies as Found in American Cases; History of the One Hundredth Anniversary of the Promulgation of the Constitution of the United States;* and is a lecturer on law at the University of Pennsylvania. Since 1903, January, he has been attorney-general of Pennsylvania.

CARSON CITY: capital of the state of Nevada, in a fertile and picturesque region near the foot of the Sierra Nevada, 178 m. e. of San Francisco. It is in Eagle Valley, Ormsby co., 4 m. from Carson river, 10 m. from lake Tahoe. The Nevada state prison is near the city. At Carson City is a United States branch mint for dealing with the immense quantities of gold and silver produced in this mining region. Pop. (1910 est.) 2,500.

CARSTAIRS, *kâr'stārz*, William: 1649, Feb. 11—1715, Aug.; b. Cathcart, near Glasgow; active in bringing about the revolution of 1688. He was educated at the village school of Ormiston, in East Lothian, and subsequently at the Univ. of Edinburgh, where he showed remarkable aptitude for learning. In his 24th year, Scotland being then in a most unsatisfactory state, alike politically and religiously, Carstairs went to study theology at Utrecht. His scholarship, polite address, knowledge of men, and great political information, recommended him to the notice of the Prince of Orange, who chose him as his confidential adviser in all matters relating to Britain. In 1682, being in England on a mission of observation from Holland, he was employed to negotiate between the English and Scotch conspirators in the Rye House Plot. With others implicated, he was arrested and put to the torture of the thumb-screw, but refused to confess anything that had not been previously revealed, and that only on condition that what he said should not be used in evidence, either directly or indirectly, against any other person. At this time he had secrets from Holland of the greatest importance in his possession, which he carefully concealed, although there can be no doubt that their revelation would not only have saved him from torture, but have obtained for him great reward and honor. Britain, therefore, owes much to the firmness of Carstairs at this juncture.

He returned to Holland about the beginning of 1685; and, acting mainly on his advice, the Prince of Orange planned and carried out the invasion of 1688. He accompanied the prince as chaplain, and after the settlement of the crown, when the prince had been firmly established as William III., Carstairs was instrumental in effecting a reconciliation between him and the Scottish Church, when the ill advice of other councilors had nearly led to an open rupture. From 1693 to the death of the king in 1702, he could not have had more influence in Scottish affairs if he had been prime-minister of the country; and his authority in church-matters was such that he was popularly called 'Cardinal Carstairs.' He was elected principal of the Univ. of Edinburgh 1704, and was presented to the church of Greyfriars. See *Life of Carstairs*, by Rev. Dr. Story (1874).

CARSTENS, *kâr'stens*, Asmus Jacob: 1754, May 10—1798, May 26; b. near Schleswig: German artist. In 1762, he went to Copenhagen, where, when first introduced to the royal gallery of paintings and casts from the antique he was so excited that he shed tears of joy. After staying seven years in the Danish capital, where he produced his *Baldur's Death*, and *Eolus and Ulysses*, supporting himself chiefly by portrait-painting, he commenced a journey on foot to Rome, but returned for want of means after reaching Mantua. He resided in Lubeck for some time, but through the kindness of a wealthy amateur artist named Rodde, he contrived to reach Berlin, where his great composition, the *Fall of the Angels* (with 200 figures), gained for him an appointment as prof. in the acad., while his decoration of a saloon in the Dorville Palace obtained an introduction to the king and a pension. He was now enabled to visit Rome, where he applied himself to the study of the works of Michael Angelo and Raphael. His first work in Rome, a *Visit of the Argonauts to the Centaur Chiron*, was distinguished by purity of style, beauty of forms, and fine distribution of light. His numerous subsequent drawings mostly represented scenes from the ancient classic poets, with subjects from Ossian, Dante, and Shakespeare.

CART, n. *kârt* [W. *cart;* Gael. *cairt*, a car, a cart; AS. *krat;* It. *carretto;* F. *charrette*—from L. *carrus*, a two-wheeled cart: two-wheeled vehicle; a light two-wheeled vehicle with springs, for business or pleasure. V. to carry away in a cart. Cart'ing, imp. Cart'ed, pp. Car'ter, n. one who drives a cart. Cartage, n. *kâr'tĭj*, conveyance in a cart; cost of goods so conveyed. Cart-horse, a strong horse for drawing a cart. Cart-load, as much as can be carried in a cart. Cart-wright, one who constructs carts.

CART: a species of carriage with two wheels. The cart is not very common in England, where the heavy and more capacious wagon takes its place (see Wagon); though it is used for agricultural and similar purposes. In Scot-

land carts are universally used. The Scotch cart weighs only about half a ton, while its usual load is from a ton to 22 cwt. In carrying hay, straw, or grain from the harvest-field, Scotch farmers employ a peculiar kind of cart without sides to admit of a bulky load; or they place on an ordinary cart a movable frame. The following advantages of one-horse carts are well enumerated by Lord R. Seymour: 'A horse, when he acts singly, will do half as much more work as when he acts in conjunction with another; that is to say, that two horses will separately do as much work as three conjunctively. This arises, in the first place, from the single horse being so near the load he draws; and in the next place, from the point or line of draught being so much below his breast, it being usual to make the wheels of single-horse carts low. A horse harnessed singly has nothing but his load to contend with; whereas, when he draws in conjunction with another he is generally embarrassed by some difference of rate, the horse behind or before him moving quicker or slower than himself; he is likewise frequently inconvenienced by the greater or less height of his neighbor; these considerations give a decided advantage to the single-horse cart. The very great ease with which a low cart is filled may be added; as a man may load it, with the help of a long-handled shovel or fork, by means of his hands only; whereas, in order to fill a higher cart, not only the man's back, but his arms and whole person must be exerted'.

The one-horse cart is employed by carriers all over Scotland: see CARRIERS. In France and Germany the carrier's cart is a more gigantic machine. Long in the body, very strong in construction, and poised on two high wheels with broad rims, this continental cart carries enormous loads, almost equal to those of the large wagons of England. The ingenious manner in which the load is adjusted to rest exclusively on the wheels, and so relieve the single horse in the shafts, is surprising to strangers.

CARTAGENA, *kâr-ta-jē'na*, Sp. *kâr-tâ-hā'nâ:* fortified seaport of Spain, on a bay of the Mediterranean; lat. 37° 36′ n., long. 0° 57′ w. It is built partly on the declivity of a hill, partly on a plane extending down to the sea, and is inclosed by hills which screen it from all winds. The harbor is one of the best in the Mediterranean, capacious enough for the largest fleets. The entrance is narrow, and completely commanded by the fortifications on an island called La Isoletta, on the south. It was formerly the largest naval arsenal not only in Spain but in Europe. The city, which is surrounded by walls, has a Moorish aspect; its streets, cathedrals, and the ruins of an old castle being of that architecture. Cartagena has manufactures of sailcloth and glass, besides extensive blast furnaces and smelting works, and a trade in barilla, agricultural produce, and esparto grass. The tunny fishery is important, and its ancient silver and lead mines, recently reopened, are again productive. In 1873, Cartagena

was seized by a communal junta, but was retaken by the national forces in 1874. Cartagena, which was a colony of the Carthaginians, was built by Hasdrubal B.C. 242, under the name of New Carthage. It was the headquarters of the Carthaginians in Spain, and soon became a city of much wealth and influence. It was captured by P. Scipio B.C. 210, and became of importance under the Romans, who are said to have employed 40,000 men daily in the mines in the neighborhood. It was sacked by the Goths, and did not again attain any note until the time of Philip II. Pop. (1900), with suburbs, 99,871.

CARTAGO, *kâr-tâ'gō:* city of the United States of Colombia, S. America, in the state of Cauca, 130 m. n.w. of Bogota; on the Viega, a tributary of the Cauca river. It was founded by the Spaniards 1540, between the rivers Otau and Quindiu, and removed to its present site about 50 years later. It has good streets and houses, a cathedral, two churches, and several schools. The surrounding country is picturesque and well cultivated. Horned cattle and swine are raised, and fruits, coffee, cacao, sugar, and tobacco exported. Pop. 8,000.

CARTAGO, or CARTHAGO: city, or rather the ruins of one, on the Cartago river, Costa Rica, about 60 m. from its mouth. Until 1841, it was the cap. of Costa Rica; but being in that year almost destroyed by an earthquake, it was supplanted by San José, previously its superior in wealth and importance, about 15 m. w.n.w. The volcano of the same name, doubtless connected with its overthrow, is a landmark to mariners.

CARTAGO, or CARTHAGO, *kâr-tâ'gō,* BAY: an almost landlocked lagoon of the Caribbean Sea near the n.w. extremity of the Mosquito shore.

CARTAGO, or CARTHAGO, RIVER: stream entering Cartago bay from the s.s.w., about lat. 15° n,. and long. 84° west.

CARTAGO, or CARTHAGO, RIVER: stream in Costa Rica, flowing into the Gulf of Nicoya, an inlet of the Pacific, near lat. 9° 30′ n., and long. 84° 30′ west.

CARTE, n. *kârt* [F. *quarte*—from L. *quarta,* the fourth]: the fourth position of the wrist in fencing, by which a thrust may be made at an enemy's breast; a form of guard in fencing.

CARTE, n. *kârt* [F. *carte,* a card—from L. *charta;* mid L. *carta,* paper]: a card; a bill of fare at a hotel.

CARTE, *kârt,* THOMAS: English historian: 1686–1754; b. Clifton, Warwickshire, Eng., where his father was parish minister. Educated at Oxford, he afterward took the degree of M.A. at Cambridge, and entering holy orders, was appointed reader at the Abbey Church, Bath; but being attached to the Stuarts, he resigned his office rather than take the oaths to the new government. In 1722, he was suspected of having been concerned in the conspiracy of Bishop Atterbury, whose secretary he was,

and £1,000 was offered for his apprehension; but he escaped to France, where he remained for some years. On his return to England, he published a life of the Duke of Ormond, remarkable for the fulness of its information. In 1747–55 he published a *History of England*, bringing it down to the year 1654. This work is very valuable for its facts; but the author, though distinguished for research, had not the capacity to grapple with these philosophically. Hume and other historians have been much indebted to him for the materials of history. Among his other works was an edition of *Thuanus;* and at his death, he left 20 folio and 15 quarto vols. of MSS., in further illustration of the history of England to 1688, which have been very useful to subsequent writers. These are preserved in the Bodleian Library, Oxford.

CARTE-BLANCHE, n. *kârt-blăngsh* [F. *carte*, paper; *blanche*, white]: a paper signed but not filled up; unconditional power to do some business for another. CARTE-DE-VISITE, n. *kârt′dĕ-vĭ-zēt′* [F.—literally, a card of visit]: a small photographic likeness gummed on a card—so-called from its being the size of a visiting card: plu. CARTES-DE-VISITE, *kârtz′dĕ-vĭ-zēt′*.

CARTEL, n. *kâr′tĕl* [F. *cartel*, a challenge—from It. *cartella*, pasteboard; *cartello*, a placard, a challenge]: formerly, a placard hung up containing a challenge; a letter of defiance or summons to fight; a written agreement between belligerents for an exchange of prisoners. CARTEL-SHIP, a ship employed in conveying exchanged prisoners, or in conveying the messenger to obtain such an exchange, but carrying no cargo, ammunition, or implements of war, except one gun for signals.

CARTER, *kâr′tĕr*, ELIZABETH: 1717, Dec.—1806, Feb.; b. Deal, in Kent, England: linguist. Slow at first to learn, she afterward showed remarkable aptitude. In her 21st year she published a small volume of poems and in the succeeding year she translated from the Italian of Algarotti *An Explanation of Newton's Philosophy for the Use of Ladies*. These publications obtained for her the friendship of such men as Bp. Butler, Abp. Secker, Sir Joshua Reynolds, Burke, and Dr. Johnson, the latter of whom especially had the highest opinion of her proficiency as a Greek scholar. A translation of Epictetus which she made, was most favorably received by the literary press of her time in various countries. She was never married.

CARTER, FRANKLIN, PH.D., LL.D., b. Waterbury, Conn., 1837, Sep.30; American scholar and teacher. He studied at Yale, and graduated at Williams in 1862; received the degree M.A. from Jefferson 1864, Ph.D. from Williams, and LL.D. from Union. In 1872, he became prof. of German in Yale, and 1881–1901 was pres. of Williams College. He was a member of the Massachusetts State Board of Education 1896–1900; and president of the Clarke School for the Deaf. He now lectures on Theism.

He has published a translation of Goethe's *Iphigenie auf Tauris,* as a text-book (1878), and a *Life of Mark Hopkins* (1892).

CARTER, Sir Frederic Bowker Terrington, Canadian jurist: b. Saint John's, Newfoundland, 1819, Feb. 12; d. Saint John's 1900, Feb. 28. He was called to the Newfoundland bar in 1842, served in the Newfoundland assembly from 1855 to 1878, and two years later became chief-justice of Newfoundland. He was knighted in 1878.

CARTER, George Robert, American politician, b. Honolulu, Hawaii, 1866, Dec. 28; was educated at Phillips Andover College and Yale University. In 1891 he was appointed Hawaiian consul at Seattle, Wash. He returned to Honolulu in 1896, and was governor of Hawaii 1903–1907.

CARTER, Henry. See Leslie, Frank.

CARTER, James Coolidge, American lawyer: b. Lancaster, Mass., 1827, Oct. 14; d. New York, 1905, Feb. 14. He was educated at Harvard, and his admission to the bar took place in New York in 1853. He was counsel for the city of New York in the famous case of the people against William M. Tweed, and in 1875 was appointed a member of the commission to devise a system of municipal rule for the cities of the State of New York. He published: *The Proposed Codification of Our Common Law* (1884); *The Provinces of the Written and the Unwritten Law* (1889); *The Ideal and Actual Law* (1890).

CARTER, James Madison Gore, American author: b. Johnson County, Ill., 1843, April 15. He was educated at the State Normal University, St. John's College, and Northwestern University Medical School. He served in an Illinois regiment during the Civil War, being captured and taken to Libby Prison. Among his works are: *Outlines of Medical Botany of the United States; Catarrhal Diseases of the Respiratory Organs;* and *Diseases of the Stomach;* and various monographs on medical topics.

CARTER, Louise Leslie, American actress: b. Louisville, Ky. Her stage career began 1890, Nov. 10, when she appeared in the *Ugly Duckling* in New York. Her other roles have been the Quakeress in *Miss Helyett;* Maryland Calvert in *The Heart of Maryland;* Zaza in *Zaza;* Madame Du Barry in *Du Barry;* Adrea in *Adrea.* In 1906, July 13, she married William Louis Payne, an actor. She is considered one of the leading actresses of the day. See Strang, *Famous Actresses;* Browne and Austin, *Who's Who on the Stage* (1906).

CARTER, Samuel Powhatan, American naval and military officer: b. Elizabethtown, Tenn., 1819, Aug. 6; d. Washington, D. C., 1891, May 26. He became a midshipman in 1840, fought in the Mexican war in coast attack, and in 1856 took part in the capture of the Barrier forts, Canton, China. In 1861 he was detailed to go to

Tennessee, where he started the Tennessee brigade. All through the Civil War he was of great service to the government, and for his gallantry was brevetted major-general of volunteers. In 1882 he was promoted rear-admiral on the retired list.

CARTER, Thomas Henry, American politician: b. Scioto County, Ohio, 1854, Oct. 30. He was bred to farming, but later became a lawyer, removing to Montana in 1882. He was Montana's first representative in Congress (1891), United States senator from that State from 1895 to 1901, and again 1905–11, chairman of the National Republican Committee in 1892–6, and was appointed in 1900 United States commissioner to the St. Louis Exposition.

CARTER, William H., American military officer and author: b. Nashville, Tenn. In 1868 he entered the United States Military Academy. Successively promoted, he became in 1898 lieutenant-colonel and assistant-adjutant-general, colonel and assistant adjutant-general 1902, April 15; and brigadier-general 1902, July 15. He served on the frontier from 1873–97, receiving a medal of honor for distinguished bravery in action at Cibicu Creek, Arizona, in 1881. In 1897 he became connected with the War Department where he remained till 1902; was connected with the Army War College till 1903, August; was assistant chief of staff to 1903, Dec. 31; and since 1904, Feb. 23, has commanded the dept. of the Visayas, Philippine Islands. He wrote: *Horses, Saddles, and Bridles*; *Historical Sketch 6th United States Cavalry;* and *From Yorktown to Santiago.*

CARTERET, Antoine Alfred Désiré, *ân-twân al-frā dā-zē-rā kâr-té-rā*, Swiss statesman and fabulist: b. Geneva, 1813, April 2, d. there 1889, Jan. 31. His political career was long and brilliant, and in literature he made a name with pleasing *Fables* (1873), frequently treating political subjects, and a novel, *Two Friends* (1872), descriptive of Genevese customs.

CARTERET, *kâr'tėr-ĕt*, Sir George, English provincial proprietor: b. St. Ouen, Jersey, between 1609–17; d. 1679, Jan. 14. He had a distinguished career in the British navy, was an active supporter of the royalist cause, was made lieutenant-governor of the island of Jersey and vice-admiral. He manifested an interest in colonization and received a royal grant, 'in perpetual inheritance,' of certain lands in America 'to be called New Jersey,' the name being taken from the island of which he had been governor. In 1651 he surrendered to the commonwealth and served for a time in the French navy, returning to England at the restoration. He was made treasurer of the navy in 1661, and suspended in 1669 for mismanagement of funds. In 1664 he was made joint proprietor with Lord Berkeley of the province of New Jersey under a grant from the Duke of York, and in 1676, when the province was divided, East Jersey

fell to his share. He was one of the first proprietors of Carolina.

CARTERET, John, Earl Granville: orator and statesman: 1690, Apr.—1763, Jan.; son of Baron Carteret of Hawnes, Bedfordshire. His education, commenced at Westminster School, was completed at Oxford. From the latter place, according to Dean Swift's humorous assertion, he carried away more Greek, Latin, and philosophy than was at all becoming a person of such high rank. Introduced into the house of peers 1711, he spoke in favor of the Protestant succession, and in consequence received the early notice of George I., and obtained some lucrative appointments. In 1718–19, he was appointed ambassador extraordinary to Sweden, and in the following year succeeded in concluding a peace between Sweden, Prussia, and Hanover. In 1721, he was appointed sec. of state, and in this capacity defended with great zeal the proceedings of government in the Atterbury conspiracy. In 1724, he was made lord-lieut. of Ireland. During his vice-regency he was in constant intercourse and held frequent discussion with Dean Swift about public affairs. His lord-lieutenancy, 1724–26, and again 1729–30, was popular, particularly the latter period. From 1730–42, he was one of the most able and determined of the leaders of the opposition in the house of lords against Sir Robert Walpole, and on his displacement, was made a sec. of state. On the death of his mother 1744 he succeeded to the title of Earl Granville, and in the same year had to resign his seals of office, the Broad-bottom administration (q.v.) expressly excluding him; but he continued to receive marks of the royal favor. Carteret was a most liberal patron of men of letters.

CARTERET, Philip, English provincial governor: d. 1682. He was appointed governor of the province of New Jersey by the proprietors, Berkeley and George Carteret, and was given power to grant land to settlers. He reached New Jersey in 1665, bringing with him about 30 settlers, and settled at Elizabethtown. He avoided trouble with the Indians by adopting the wise policy of buying the land from them or requiring the colonists to do so. In 1672 he went to England for a time, but returned in 1674, and during his absence New Jersey was in the possession of the Dutch for a year, 1673–4. In 1676, when the division of the province into East and West Jersey was completed, he became governor of East Jersey, holding the position till his death.

CARTESIAN, a. *kâr-tē'zhĭ-ăn:* pertaining to the doctrines of the French philosopher Descartes (q.v.): N. a person who believes in Cartesianism. Cartesianism, the philosophy of René Descartes and his school, among whom may be reckoned Geulinex, Malebranche Arnauld, Nicole, and many who stood outside the circle of professional philosophers like Bousset and Fénélon. Spinoza and Leibnitz have much in common with Descartes.

CARTHAGE, *kär'thĭj*, called *Carthāgo* by the Romans, *Carchēdon* by the Greeks, both of which are but forms of the native name *Karth-hadtha*, i. e., 'New Town' (found on ancient coins): greatest city of antiquity on the n. coast of Africa, situated in what now constitutes the state of Tunis, on a peninsula extending into a small bay of the Mediterranean Sea. It was founded, according to legend, by Dido (q.v.), a Phœnician queen, who had fled from Tyre after the murder of her husband almost nine centuries before the Christian era, but more probably (like the Anglo-Indian Calcutta) it originated in an emporium or *factory* established by the colonial merchants of Utica, and the capitalists of the mother city Tyre, on account of the convenience of its situation Little is known of its growth. Modern information of C. begins only after C. had become one of the greatest commercial cities of the world, and the accounts of it even then are scanty. The pop. before its destruction was about 700,000, partly of Phœnician, partly of Libyan descent. The territory which the Carthaginians acquired by the subjugation of the Libyan tribes, and by the ultimate annexation of older Phœnician colonies, with which they had at first been simply in alliance, such as Utica, Hadrumetum, Tunis, Hippo, the two Leptes, etc., extended in the middle of B.C. 5th c. s. to Lake Triton, e. to the Great Syrtis, and w. to Hipporegius (now Bona). The maritime power of the Carthaginians enabled them also to extend their settlements and conquests to the other coasts of the Mediterranean. In B.C. 6th c., they were masters of Sardinia, and had begun to contend for the possession of Sicily. Hanno (q.v.) founded colonies on the w. coast of Africa beyond the Straits of Gibraltar, and Himilco visited the coasts of Spain and Gaul. The relations of C. to foreign states in earlier times are not very clear. The first treaty with the Romans was concluded B.C. 509; the second, B.C. 348; the third, B.C. 306. The connected history of C. begins with B.C. 5th c., a period of wars between the Carthaginians and the Greeks in Sicily. The Carthaginian army under Hamilcar was destroyed by Gelon at Himera B.C. 480. It was not till B.C. 410 that the war began which ended in the conquest by the Carthaginians of some parts of the island. Dionysius the elder, or rather the pestilence working for him, put a stop to their conquests, but did not succeed in expelling them. War raged almost constantly between Dionysius and the Carthaginians. The more feeble reign of Dionysius the younger afforded them an opportunity of extending their conquests, yet they were frequently repelled and defeated by the Sicilian Greeks; and during B.C. 311–301, Agathocles carried the war into Africa, and attacked C. itself. After his death the Carthaginians again increased their dominions in Sicily; and although Pyrrhus contended successfully against them at first he left that island entirely B.C. 275. The subjugation of the s. of Italy by the Romans, brought the two great and conquering nations into collision, and the first Punic war arose B.C. 264, and after a great naval victory of the Romans, ended in 241, the Carthaginians giving up Sicily, Sardinia, and Corsica, and paying to the Romans a large sum of money. Soon after this, a mu-

tiny of the hired troops of C., combined with an insurrection of the Libyan tribes, the ancient inhabitants of the country, who were kept down by the arbitrary rule of the Charthaginian colonists, threatened the entire ruin of the city. Hamilcar brought that bloody war, however, to a successful termination, and led an army to Spain, where he, and after him Hasdrubal, obtained great successess. Here was founded New C., now Cartagena (q.v.). After Hasdrubal's death, B.C. 221, Hannibal (q.v.), burning to revenge the defeat which his native city had sustained from the Romans, broke the treaty with them, and took Saguntum, B.C. 219. Thus began the second Punic war, in which Hannibal pursued his career of conquest from Spain, through Gaul, and across the Alps into Italy itself, defeated the Romans with terrible slaughter in various battles, and, by that of Cannæ in particular, brought Rome to the very brink of ruin. Yet the war terminated in the total defeat of the Carthaginians by Publius Cornelius Scipio, who overthrew their power in Spain, and was victorious over Hannibal in the final and decisive battle of Zama, in Africa, B.C. 202, Oct. A peace was then concluded, in which the Carthaginians were limited to their African territories; but most of their ships of war and war-elephants were taken from them, besides an immense sum of money, and they were put under bond not to make war without permission of the Romans. Massinissa, King of Numidia, skilfully availed himself of dissensions which arose within C. between the nobles and the people, to advance his own interests at the expense of the Carthaginians; and as they (B.C. 151) opposed him, and drove his adherents out of the city, the Romans seized the opportunity for a new declaration of war, B.C. 149, on the ground that the treaty was broken; and after a siege of two years, C. was taken by Publius Cornelius Scipio Aemilianus, B.C. 146. For six days the combat was maintained in the streets of the city, and for seventeen days the work of its destruction by fire was carried on by the conquerors. The country became a Roman province. C. Gracchus sent out 6,000 colonists to found a new city on the site of Carthage. It was called Junonia, but it did not prosper. Augustus, carrying out the intention of his great uncle, restored the city, and the new C. had become, in the 2d and 3d c. of the Christian era, one of the finest cities of the Roman empire. In A.D. 439, Genseric made it the cap. of the Vandal kingdom; Belisarius conquered it 533, and named it Justiniana; the Arabs under Hassan utterly destroyed it 647; and now only two or three small hamlets and a few ruins mark its site.

There remain no satisfactory accounts of the constitution of the Carthaginian state. It is certain that it was oligarchical, and that the chief power was in the hands of the great families (gentes), from whose members the senate, amounting to 300, was chosen. This senate appointed, as it were, a more select council of 30, and sometimes a still smaller one of only 10, at the head of whom were two *suffetes* (probably the same as the Hebrew *shofetem*, 'judges'), but it is not certain what relation these bore to one another, or how their power was apportioned between them. We can gather

dimly, from various scattered statements, that the Carthaginian oligarchy, while despising the multitude, was itself split up into factions, and torn by family jealousies. Corruption prevailed; and it would perhaps have been better for the country if the power had been in the hands of a popular despot than of a band of insolent and tyrannical nobles.

The Carthaginian army was raised from the conscription of the subjugated Libyans, from the hired Numidians, and from slaves. In the time of Agathocles, the city sent forth 40,000 heavy-armed infantry, 1,000 cavalry, and 2,000 war-chariots, but the state could easily raise 100,000 troops. The fleet in the first Punic war consisted of 350 ships, carrying 150,000 men. How Carthage contrived to raise revenues sufficient to cover the enormous expense her military and naval organization involved, is not clear. It was probably derived from tribute imposed on subject Libyan or Numidian races, in great part from mines in Spain, and from import duties derived from her maritime and inland trade, which was prodigiously great. Her merchantmen visited every coast and island of the Mediterranean, and even ventured as far as the Azores, Britain, the Baltic, etc.; while her caravans penetrated through Sahara to the gold-producing districts of the Niger, and through the Libyan desert to the lands along the Nile.

The religion of the Carthaginians appears to have been substantially the same as that of the Phœnicians—a worship of the stars and of fire. Moloch was the chief deity, and to him children and captives were sacrificed. The highest natural manifestation of this deity was the sun. Besides Moloch, the Carthaginians worshipped the Tyrian Hercules; Astarte, the goddess of the elements; Esmun, the god of the celestial vault; and a variety of heroes, heroines, and genii or spirits, such as the Genius of Death, Hamilcar (who fell at the battle of Himera), Dido, the brothers Philæni, etc., as well as a few of the lesser Greek divinities, of whom a knowledge had been obtained in Sicily. It does not appear that there was a distinct sacerdotal order in Carthage. It is conjectured that religious ceremonies were performed by the dignitaries of the state. Their religion was considerably modified by their intercourse with the Greeks. After their defeat by Gelon he made it a condition of peace with them that they should abandon human sacrifices. Some of their deities were identified with those of the Greeks, and they adopted others of that people, and no doubt received also some of their ideas regarding them. Consult Arnold's and Mommsen's histories of Rome; R. B. Smith, *Carthage and the Carthaginians;* A. Church, *Carthage, or the Empire of Africa*; N. Davis, *Carthage and Her Remains.*

CARTHAGE, Mo., city and county-seat of Jasper County, in the southwestern part of the State, on Spring River, and on the St. Louis & San F., Missouri Pac., Iron

M., and Carthage and Western Railways, 150 miles south of Kansas City. It is the centre of a fertile farming and fruit-raising region, and in the vicinity are rich mines of zinc and lead and extensive quarries of marble and building stone. The city exports large shipments of stone, marble, grain, flour, strawberries and other fruits, poultry, live stock, and hides. It has six large quarries, zinc and stone works, stove, bed-spring, furniture, and canning factories, flour and woolen mills, and machine shops. There are four banks with $400,000 capital and an annual business of $2,000,000; and daily and weekly newspapers. Carthage has a county court-house (cost $100,000), a public library, good public schools, a business college, a piano school, and is the seat of Carthage Collegiate Institute. The following churches are represented: Presbyterian, Cumberland Presbyterian, Congregationalist, Baptist, Methodist (North and South), Episcopal, Christian, Roman Catholic, Dunkard, and Adventist. The site of the city was first settled in 1833 by Henry Piercy. In 1842, March 28, it was made the county-seat and named Carthage. The town was practically destroyed in the Civil War (see CARTHAGE, BATTLE OF) and has been almost entirely rebuilt since 1866. The government is vested in a mayor and ten councilmen elected for a term of two years. Pop. (1900) 9,416; (1910) 9,483.

CARTHAGE, BATTLE OF: one of the minor engagements of the civil war, 1861, July 5. On the morning of the 5th July, Col. Sigel, with less than 1500 men, was advancing from the vicinity of Neosho, Mo., to intercept Gov. Jackson, who was moving southward from Lexington, Mo., to unite with Gen. Sterling Price, in southwest Missouri, and with Gen. McCulloch, who had entered Missouri from Arkansas. When about 9 miles beyond Carthage, Jasper Co., Sigel encountered the Confederates, about 5,000 strong, mostly mounted men. Sigel opened the engagement with artillery, but was finally outflanked by the Confederate horsemen, and forced back to Carthage, then to Sarcoxie, with a loss of 13 killed and 31 wounded. The Confederate loss was about 30 killed and 125 wounded.

CARTHAGE, CAPE: headland of n. Africa, jutting out into the Mediterranean, lat. 36° 52′ n., long. 10° 22′ e. Traces of the ancient city of Carthage (q.v.) are found on it n. of the Tunis lagoon.

CARTHAGENA, *kâr-ta-jē′na*, Sp. *kâr-tâ-hā′nâ:* capital of the state of Bolivar, one of the United States of Colombia. It stands on the Caribbean Sea, a little s.w. of the mouth of the Magdalena, lat. 10° 26′ n., long. 77° 54′ w., having the best harbor on the coast, with a naval arsenal and strong fortifications, completed 1717 at enormous cost. The temperature ranges from 80° to 86° F.—the air, however, being dry and healthy. In the history of Spanish America, and more especially in that of the war of independence, the city occupies a prominent place.

It was founded 1533, Jan. 21, by Pedro de Heredia. Early in the 17th century it ranked next below Mexico among the cities of the Western world, and was called 'Queen of the Indies.' At that time its inhabitants numbered about 20,000, of whom 3,000 were Spaniards; it was strongly fortified, and one of the main entrepôts of commerce between the hemispheres—a distinction due in part, to its proximity to the Isthmian route, but even more to the excellence of its harbor, which is one of the best on the northern coast of South America. As the principal stronghold of Spanish America, it was repeatedly attacked: by a French fleet in 1544; by the English under Drake in 1585; again by the French in 1697; and by the English under Vernon in 1741. The town remained Spanish until 1815, when Bolivar took it; but the same year it was surrendered to the royalists, after a memorably heroic defense; and finally it was taken by Republican forces 25 Sept. 1821. Its population at present is little more than one half the number accredited to it three centuries ago.

CARTHAGENA BARK: see CINCHONA.

CARTHAGINIAN, a. *kär'thă-jĭn'ĭ-ăn:* pertaining to ancient Carthage: N. a native of.

CARTHAGO, NOVA: see CARTAGENA.

CARTHAMUS, n. *kär'thă-mŭs* [new L.—from Gr. *kathairo,* I purge, I purify]: the wild or bastard saffron; safflower (q.v.); the *Carthămus tinctōrĭŭs,* ord. *Compositæ,* sub-ord. *Cynărōcephălæ.* CARTHAMINE, n. *-mĭn,* or CARTHAMEINE, the pink dye or coloring matter obtained by a chemical process from the safflower in crystals insoluble in water, but slightly soluble in alcohol and ether. When newly precipitated, C. immediately and permanently attaches itself to cotton or silk, but not to wool, requiring no mordant, dyeing the fabric a fine red, which is changed to yellow on the addition of alkalies, and may be returned to red again on being treated with acids.

CARTHUSIAN, n. *kär-thū'zhĭ-ăn:* one of an order of monks, named from Chartreux in France: also an alumnus of the Charterhouse School in London, once a Carthusian monastery. ADJ. pertaining to. The Carthusians originated with St. Bruno, who retired in 1086 with six companions to the solitude of La Chartreuse near Grenoble, where they built hermitages, wore rude garments, and lived upon vegetables and coarse bread. In 1134, the fifth prior, Guigo, composed a body of rules, called the *Statuta Guigonis* or *Consuetudines Cartusiæ,* but they have been often changed. After 1170, when the order received papal approbation, it extended rapidly. It dates from 1180 in England, where the name of Chartreuse-houses was corrupted into charter-houses. The Carthusians were divided into two classes, fathers (*patres*) and brothers (*conversi*). Each occupied a separate cell, with a bed of straw, a pillow, a woolen coverlet, and the means of manual labor or of writing. They

left their cells, even for meals, only on festivals and on days of the funeral of a brother of the order. Thrice a week they fasted on bread, water, and salt, and there were several lengthened fasts in the year. Flesh was forbidden at all times, and wine, unless mixed with water. Unbroken silence, except on rare occasions, was enforced, as well as frequent prayer and night-watching. These austerities were continued, with little modification, by the modern Carthusians. The order at one time counted 16 provinces, and can still boast some of the most magnificent convents in the world—as *La Grande Chartreuse*, near Grenoble, and *Certosa*, near Pavia. They were given to hospitality and works of charity, and were on the whole better educated than the mendicant orders. Their principal seats were in Italy, France, and Switzerland; but they have shared the fate of the other monastic establishments, and their convents are now for the most part solitudes.

The Carthusian nuns arose at Salette, on the Rhone, in France, about 1229. They followed the rules of the Carthusian monks, but with some mitigations, of which the most notable is that they have a common refectory.

CARTIER, *kâr-tyā'*, Sir George Étienne: 1814, Sep. 6—1873, May 20: Canadian statesman, descendant of Jacques C.: b. St. Antoine. He was educated at St. Sulpice, Montreal, and began to practice law in that city 1835. In the rebellion of 1837, C. took up arms, and a price of $2,000 was put on his head, but he escaped and was afterward amnestied. He was elected to the house of assembly from co. Verchères 1848, and became provincial-sec. 1856, soon afterward attorney-gen., and premier 1858. From this time C. was steadily in the cabinet, except for one year. He bore a part in abolishing feudal tenure in Lower Canada, in codifying its laws, in making the legislative council elective, and in the confederation of the various provinces. He was made a baronet 1868. While minister of militia his health failed, and he died during a visit to England.

CARTIER, Jacques: 1494, Dec. 31—abt. 1555; navigator and explorer; b. St. Malo, Brittany, France. He sailed from his native town 1534, April 20, in command of two ships and 120 men, reached Newfoundland May 10, passed n. and then w., and claimed Labrador and Canada for the French king by erecting crosses. He reached home with two Indian boys Sep. 5, but the next year went out with three vessels, sailed up the St. Lawrence to Hochelaga, which he called Mont Royal (thence Montreal) 1535, Oct. 2. Wintering at the mouth of the Ste. Croix, the party suffered from scurvy, a disease then unknown to Europeans, and returned in disgust, 1536, with ten chiefs whom Cartier had kidnapped. The idea of colonizing Canada was abandoned till Roberval obtained permission to form a settlement. At his expense and the king's Cartier was sent out 1541, May 23 with five ships, as 'captain-general and chief-pilot;' he

arrived at the Ste. Croix Aug. 23, and built a fort, Charlesbourg, near the site of Quebec. The Indians gave trouble, and Cartier went back 1542, meeting Roberval at Newfoundland, and disregarding his command to stop. His supposed fourth voyage, 1543, to bring Roberval back, is uncertain. He gave no sign of appreciating the importance of his discoveries. Francis I. rewarded him with the lordship of Limoilon; the date of his death is not exactly known. Journals of his first and second voyages appeared in Ramusio's *Collection*, Venice, 1565, and an account of his third in Hakluyt's *Voyages*, 1600. These were collected by the Historical Soc. of Quebec 1843.

CARTILAGE, n. *kâr'tĭ-lāj* [F. *cartilage*—from L. *cartĭlagĭnem*, gristle]: gristle; a tough elastic substance, incapable of extension, which usually precedes the formation of bone. CARTILAGINOUS, a. *-tĭ-lăj'ĭ-nŭs*, having gristle instead of bones. Cartilage is of a pearly whiteness, and to the unaided eye seems uniform and homogeneous. Cartilages may be divided into *temporary* and *permanent*. The *temporary* cartilages are substitutes for bone in the earlier periods of life, and after a certain time become ossified: see OSTEOLOGY. At birth the extremities and larger eminences of the long bones, and the margins of the flat bones are still cartilaginous, and this cartilage does not altogether disappear till the period of puberty. The *permanent* cartilages are either *articular* or *non-articular*. *Articular* cartilages are attached to the extremities of bones, and enter into the formations of joints. *Non-articular* cartilages are usually more flexible than the articular. They are sometimes attached to bones, to lengthen them out, as, for instance, in the nose, the auditory canal, and the Eustachian tube. In other cases they form the basis of distinct organs, as the larynx, the trachea, and the eyelids. According to its structure cartilage is divided into hyaline cartilage, fibro-cartilage, and fibro-elastic cartilage. Hyaline C. is that from which bone is formed; it is also found as a permanent C. at the articular ends of the bones. Fibro-elastic C. is found in the Eustachian tube in parts of the larynx and of the external ear. Fibro-C. is found between the vertebræ, between the pelvic bones, and at the joint ends of other bones, usually when there is not very free motion.

CARTILAGINOUS FISHES, *kâr-tĭ-lăj'ĭ-nŭs:* fishes which have a skeleton destitute of bony fibres. In some of these fishes, the skeleton is merely rudimentary, so that they seem to form an intermediate link between vertebrate and invertebrate animals. In the lancelets (q.v.) (*Amphioxus*), it consists of nothing more than a slender, transparent, flexible dorsal column; in *Myxine*, also, it is a soft, flexible tube, without appearance of vertebræ or of ribs; in the lampreys, the dorsal column is still a mere cylinder of cartilage, without any notable division into segments; while even in the sturgeon, the centre of the backbone is a continuous gelatinous cord,

and in the sharks the vertebræ are formed of hollow cones, meeting at their apices in the middle, and having their cups filled with the remains of the gelatinous cord, an arrangement from which result great elasticity and flexibility. In many instances, even in the higher cartilaginous fishes, several vertebræ are united in a single piece; in all of them the skull is formed of a single piece without sutures, though the general form agrees with that of the skull of other fishes, and the same parts or regions may be recognized. The calcareous matter present in the skeleton is always deposited in a granular manner, giving a characteristic dotted appearance; but even in the skull of the basking shark, one of the most highly organized, the earthy matter has been found to form little more than three per cent. of the whole substance; in the skeleton of the lamprey, it is only one and a half per cent. In other parts of their organization cartilaginous fishes differ from each other very widely, some of them possessing the organs of the senses in as great perfection as any fishes whatever, while in others these organs are very imperfectly developed. Linnæus placed the cartilaginous fishes with batrachian reptiles in his class *Amphibia*. By the general consent of naturalists, however, they are placed in the class of fishes. Cuvier, referring to the very different degrees of organization which they exhibit, says 'they form a series ranging parallel to the bony fishes, just as the marsupial mammalia range parallel with the other ordinary mammalia.' Owen and others, admitting the justice of this view, have, however, pointed out in the cartilaginous fishes generally characters corresponding with those of the osseous fishes in their embryotic state, and with the permanent or mature conditions which prevailed among the fishes of some of the older geological periods. One remarkable characteristic even of the higher groups of cartilaginous fishes—sturgeons, sharks, rays, etc.—is the *heterocercal* tail, the vertebral column being prolonged into the upper portion of the caudal fin, and the lower one given off on its under side.

CARTOGRAPHY, n. *kâr-tŏg′ra-fĭ*, or CHARTOGRAPHY, n. *chârt-tŏg′ra-fĭ* [Gr. *charte;* L. *charta*, a leaf of paper; F. *carte*, card, chart; Gr. *grapho*, I write]: the art of forming maps or charts.

CARTON, n. *kâr′tŭn:* a pasteboard box or the material of which it is made.

CARTOON, n. *kâr-tōn′* [It. *cartone*, pasteboard—from *carta*, paper; L. *charta*]: in the *fine arts*, cartoon is a design on strong paper, of the full size of a work to be afterward executed in fresco, oil color, mosaics, or tapestry, or on a glass. Cartoons are most generally composed of a number of sheets of stout paper or pasteboard, pasted together at the edges, and stretched on a frame. The surface is sometimes *primed*, or washed with a ground-color; but more frequently this process is dispensed with. The drawing is made either in chalks or in *distemper* (q.v.), in which latter case the cartoon itself has much

the appearance of a fresco. Frequently only two colors are used, merely for the purpose of producing light and shade, in which case the C. is said to be *in chiaro oscuro*. The C., when finished, is transferred to the canvas or plaster on which the work is to be executed, either by tracing with a hard point, or by pricking with pins, charcoal in both cases being used. Sometimes lines are simply drawn across it, or, if it is wished to preserve it from injury, threads are stretched across it from pins placed at the required distances along the edges. In *fresco* painting (q.v.), the plaster on which the work is excuted must be wet, in order that it may absorb the color, and consequently only a small portion can be executed at a time, and the C. must be traced in small compartments of the size that the artist can finish without stopping. It is here, consequently, above all, that the necessity for the previous execution of a C. is greatest, as it would be impossible to sketch the whole design on the plaster in the first instance. But the great masters used such studies in *chiaro oscuro* as guides to them in almost all their extensive works, and many of these monuments of their care, as well as of their genius, have been preserved. We have cartoons of Andrea Mantegna, Domenichino, the Caracci, etc.; but the finest specimens of cartoons in existence are those of Raphael at Hampton Court. These marvellous conceptions were sent to Flanders in the reign of Leo X., in order that they might be copied in tapestry in two sets, one designed for the pope, the other for a present by the pope to Henry VIII. of England. The tapestries, which are very inferior to the designs, are still in existence. One set is in Rome, the other was in England to the death of Charles I., when it was purchased by the Spanish ambassador, and carried to Spain. At a recent period it was sent to London and offered for sale, but as no English purchaser was found, it was again carried to the continent. For many years the cartoons, originally 25 in number, lay neglected at Brussels, and many of them were destroyed. The seven now at Hampton Court were at length purchased by Rubens for King Charles I. It is an instance of Cromwell's good sense, in a direction not often associated with his name, that at the despersion of the royal collections, these cartoons were purchased for the nation by his special command. So low was the artistical taste of the time, however, that while the *Triumph of Julius Cæsar* by Andrea Mantegna, still at Hampton Court, was valued at £2,000, the cartoons of Raphael were set down at £300! In Charles II.'s time, these remarkable works were again consigned to oblivion. An attempt was made to have them copied in tapestry, by which they were seriously injured. William III., strangely enough, followed in Cromwell's footsteps in appreciating what Charles II. had neglected. He had the cartoons restored, and built a gallery for them at Hampton Court, where, with the exception of a visit to Windsor in George III.'s time, they have since sojourned. The following are the subjects of these exquisite conceptions: 1. Paul Preaching at Athens; 2. The Death of Ananias; 3. Elymas, the Sorcerer, struck with Blindness; 4. Christ Delivering the Keys to Peter; 5. The Sacrifice at Lystra; 6.

The Apostles Healing the Sick at the 'Beautiful Gate' of the Temple; 7. The Miraculous Draught of Fishes. Several of the lost cartoons are partially transmitted to us by engravings, some of which were executed from the tapestries; others, it is believed, from the originals. The subjects of these are—1. The Adoration of the Kings; 2. Christ appearing to Mary Magdalene; 3. The Disciples of Emmaus; 4. The Murder of the Innocents; 5. The Ascension. These were engraved with the others, by Somereau, a French engraver, in 4to. Other cartoons of Raphael exist—one the property of the Duke of Bucclench, and two in the possession of the king of Italy, which are said to have belonged to the set sent to Flanders. There is also a portion of one in the National Gallery in London, but it is now painted over with oil color. The best engravings of the cartoons at Hampton Court are by Dorigny, Audran, and Holloway; but in future it is probable that they will be more known to the public by photographs.

CARTOUCH, or CARTOUCHE, n. *kâr-tôsh'* [F. *cartouche*—from It. *cartoccio*, a paper case]: paper case or roll containing a charge for fire-arms; a soldier's cartridge-box; formerly a small wooden case filled with 200–300 musket-bullets, and eight or ten one lb. balls to be fired from a mortar or howitzer (now superseded); a pass or ticket of leave given to a soldier; in *arch.*, a tablet, either for ornament or to receive an inscription, so formed as to resemble a sheet of paper or parchment, with the edges and ends rolled up; often seen on tombs; also, a modillion, or bracket supporting a cornice; an oval on which the hieroglyphics for the names of Egyptian kings are sculptured; see CAVO-RILIEVO.

CARTOUCHE, *kâr-tôsh'*, LOUIS DOMINIQUE: abt. 1693-1721, Nov. 28; b. Paris: robber. Expelled from school, and afterward from his father's house, for theft, he joined a band of outlaws in Normandy. Returning to the capital he became the head of a company of banditti, over whom he exercised power of life and death, and terrorized Paris for some years, though a high price was put on his head. At length he was arrested by chance in a cabaret. His trial lasted several months and caused much excitement. On the rack he betrayed none of his accomplices, but it is said he gave their names at the place of execution, in revenge for their not attempting a rescue. Expecting a sortie by his comrades, a vast crowd gathered to see him broken on the wheel. His life has been written several times.

CARTRIDGE, n. *kâr'trĭj* [a corruption of *cartouch:* L. *charta*, paper]: a small bag or case made of paper, pasteboard, wool, etc., for containing powder and balls, used for loading rifles or cannon—containing powder alone they are called BLANK-CARTRIDGES—with ball they are called BALL-CARTIDGES. CARTRIDGE-BOX, the small leather case in which the soldier holds his cartridges. CARTRIDGE-PAPER, light-colored strong paper, originally manufactured for soldiers' cartridges (q.v.); extensively used in art, its rough surface being useful for certain kinds of drawing.

CARTRIDGE, n. from *charta*, paper. Old form *cartrage;* Fr. *cartouche.* A case of metal, paper or other material, containing a charge of powder, ball or shot, for use in firearms.

The cartridge has undergone many changes in its development. Originally intended for use in muzzle-loading weapons, powder was poured in the muzzle, the ball then inserted, each being carried separately. A cartridge

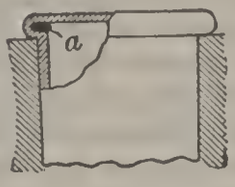


Fig. 1.—Rim fire Cartridge head

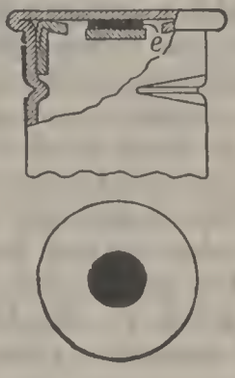


Fig. 2.—Cup-anvil Cartridge head

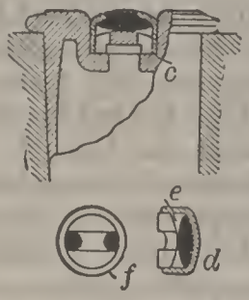


Fig. 3.—Solid-head Cartridge

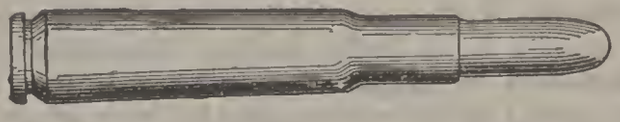


Fig. 4.—Magnzine Rifle Cartridge

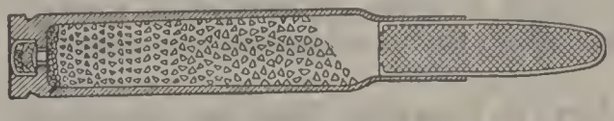


Fig. 5.—Cross Section Magazine Rifle Cartridge

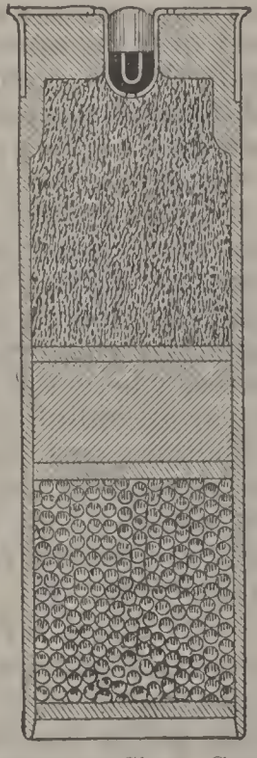


Fig. 6.—Shot Gun Cartridge

was afterwards formed by wrapping the powder in paper' hence the name. Next the ball was attached, the powder and ball being in one package. To load, the paper was torn open, the powder poured in the muzzle, and the ball then inserted and driven home.

In the Civil War such cartridges were used—the command 'Tear cartridge' being used in the manual of arms for loading. With the invention of the breech-loader,

and in order to obviate the escape of gas at the breech. and other difficulties, a metal case became necessary, This, however, involved increase both in weight and expense.

Various forms of metal cartridges have been devised and are now used for rifles, pistols and shotguns, including certain classes of the heavier ordnance, such as machine-guns and the smaller calibres of rapid-fire guns, used both on land and sea.

The pin-fire cartridge, originally devised, has been supplanted by rim and centre-fire cartridges. These include the folded-head-cup-anvil and solid-head cartridges In the rim-fire the fulminate was placed as shown in diagram, Fig. 1 at *a*, in the fold of the head.

The folded-head cup-anvil cartridge, central fire, is shown in Fig. 2. The fulminate is shown at *e*. The solid-head cartridge, also central fire, is shown in Fig. 3. The primer is placed in pocket at *c*, and consists of cup *d*, fulminate *e*, and anvil, *f*. Modern cartridges, for the improved system of magazine rifles, are shown in Figs. 4 and 5.

Such cartridges in which the ball is attached to the cartridge-case are called *fixed ammunition*. Formerly used only in arms of the smallest calibre, they are now used, almost exclusively, in all guns up to four inches in calibre, by means of which the rapidity of fire is enormously increased.

Cartridges, on account of the greatly reduced calibre of modern firearms, using a light bullet and smokless powders, are greatly decreased in weight; a greater number, consequently, can be carried by the soldier, and by improved methods, are rapidly and cheaply made by machinery, which has reached a high state of perfection in the United States, where the industry is an immense one. In time of war an unlimited supply could be produced.

Shotgun cartridges, although made with metal cases, are principally of paper. They are loaded largely by machinery. Fig. 6 shows a cross section of a modern shotgun cartridge loaded in the usual manner as supplied to the trade.

CARTWRIGHT, *kârt'rīt*, EDMUND: 1743, Ap. 24—1823, Oct.; b. Marnham, Nottinghamshire, England: inventor of the power-loom. Educated at Oxford, he obtained a living in the English Church, and devoted himself exclusively to his ministerial duties and to literature, until a casual conversation, 1784, directed his attention to machinery, and in 1785 he exhibited his first power-loom (q.v.) in action, an ingenious though very rude machine; upon which, however, he effected improvements rendering it almost perfect. Its introduction was vehemently opposed, and a mill fitted up with 500 of his looms was ignorantly and maliciously burned down. Cartwright, in 1790, took out a patent for combing wool, and secured patents for various other improvements in connection with manufactures. But his patents yielded him little return, and

in 1809, government, in consideration of his inventions, granted him £10,000. Cartwright was the author of a legendary poem, entitled *Arminia and Elvira.*

CART'WRIGHT, JOHN: 1740, Sep. 28—1824, Sep. 23; b. Marnham, Nottinghamshire, England: parliamentary reformer. He entered the navy at the age of 18, served under Hawks and Palliser, and was chief magistrate of the Newfoundland station for five years, during which he explored the interior of the island. His liberal views were expressed in *American Independence the Glory and Interest of Great Britain* (1774). Sympathizing with the colonists, he refused to fight against them, renounced a prospect of naval promotion, and asked to be placed on the retired-list. Lord Howe tried in vain to shake his resolution. The first publication on parliamentary reform except Earl Stanhope's pamphlets, 1774, was Cartwright's *Take your Choice*, called in a second edition *The Legislative Rights of the Commonalty Vindicated.* His effort was now devoted to the cause of universal suffrage and annual parliaments. He was an unsuccessful candidate for parliament 1778. He founded the Society for Constitutional Information 1780, and later the Corresponding Society; was a witness at the trial of his friends Horne Tooke, Thelwall, and Hardy, 1794; published many pamphlets, and labored untiringly. He removed to London 1810. Having advised Birmingham, which had no representation, to send to the house of commons a 'legislatorial attorney,' he was indicted 1819 for conspiracy and sedition, convicted 1820, and fined £100.

CART'WRIGHT, PETER, D.D.: 1785, Sep. 1—1872, Sep. 25; b. Amherst co., Va., but taken to Ky. in childhood. He entered the Methodist ministry 1807, and won much fame as an itinerant on the border. His rude eloquence, dauntless courage, and primitive zeal made 'the backwoods preacher' a power in the west, and one of the great names of his connection, in which he was a presiding elder from 1812. He served 20 years in Ky. and Tenn., and 45 in the Ill. Conference; baptized over 12,000 persons, received 10,000 into membership, and preached some 15,000 sermons. His autobiography, edited by W. P. Strickland, appeared 1856.

CARTWRIGHT, Sir RICHARD JOHN, Canadian statesman: b. Kingston, Ont., 1835, Dec. 4. He was educated at Trinity College, Dublin, and entered Canadian politics as a Conservative, but on account of a disagreement with Sir John A. Macdonald joined the Liberal party. He has served in the Canadian Parliament almost continually since 1863. He was minister of finance from 1873 until 1878, when his opposition to the policy of protection caused his downfall. He is an able speaker and an authority on finance. In 1897 he was a member of a Canadian commercial commission to the United States. He was knighted in 1879. Since 1896 he has been minister of trade and commerce.

CART'WRIGHT, Thomas: abt. 1535–1603, Dec.; b. Hertfordshire, England: Puritan divine. He studied at Cambridge, where, in 1570, he was chosen Margaret divinity professor. His lectures here were too honestly critical of the polity of the church to be acceptable to the chief authorities, who deprived him of his professorship, and subsequently of his fellowship. Cartwright travelled on the continent and made the friendship of such men as Beza, who, in a letter concerning him, says, 'I think the sun doth not see a more learned man.' On his return to England, he again became embroiled with the church and the government, and for his nonconformity suffered imprisonment several times. He entered into the memorable and protracted controversy with Abp. Whitgift, which took a wide range as between prelacy and a presbyterian puritanism, and has been continued in the English Church by the successors of these two champions to this day. Cartwright's claim was that the church should be reformed in government as well as in doctrine, to accord with the Scriptures. He prepared the *Directory of Church Government*, issued by authority of the long parliament, more than 40 years after his death By his learning, his intellectual power, and his unfaltering zeal, Cartwright was the hero of English Presbyterianism. He wrote many controversial articles; among them, *A Confutation of the Rhenish Translation, Glosses, and Annotations on the New Testament.*

CARUCATE, n. *kăr'ū-kāt* [mid. L. *car'uca*, a plow]: in *OE.*, the quantity of land which can be plowed in a year.

CARUNCLE, n. *kăr-ŭng'kl* [L. *caruncŭla*, a little piece of flesh—from *carnem*, flesh]: a small fleshy excrescence, diseased or natural, as the comb of a cock; in *bot.*, a fleshy or thickened appendage at the hilum of some seeds. Carun'cular, a. *-kū-lėr*, pertaining to, or having the form of a caruncle. Carun'culate, a. *-lāt*, having a fleshy excrescence.

CARUS, *kâ-rŭs*, Julius Victor, German zoologist: b. Leipsic, 1823, Aug. 25. After studying at Leipsic, Würzburg, and Frieburg, he became at the age of 26 keeper of the Oxford museum of comparative anatomy. In 1853, two years after his return to his native city, he was appointed professor of comparative anatomy and director of the Zoological Institute there. Among his numerous writings are: *System der Tierischen Morphologie* (1853); *Handbuch der Zoologie;* and *Geschichte der Zoologie.* He has translated most of Darwin's works into German.

CARUS, Karl Gustav: German scholar, physiologist, physician, and artist: 1789, Jan. 3—1869, July; b. Leipzig. He attracted notice first by a series of lectures on comparative anatomy, in his native city about 1812. After having superintended, during the war of 1813, the French hospital at Pfaffendorf, he went to Dresden, where he was appointed prof. of midwifery in the newly organized medico-

chirurgical acad.; but resigned his office when elected court-physician and councilor of state. His house was the rendezvous of all the most distinguished savants and artists in Dresden. Carus wrote a vast variety of works, some of which are marked by original and striking views, as, for instance, *Ueber den Krieslauf des Blutes der Insecten*, in which he demonstrates the circulation of the blood in insects. His writings cover a wide field of science, including medicine, physiology, anatomy, psychology, physics, painting, besides memoirs of his life. Among these are *System der Physiologie* (1838–40); *Lebenserinnerungen und Denkwürdigkeiten* (1865–6); *Lehrbuch der Zootomie* (1818); *Psyche* (1851).

CARUS, *kār'ŭs*, Marcus Aurelius, Roman emperor: b. Nerona, Dalmatia, about 222 A.D.; d. near Ctesiphon, Mesopotamia, 283. His father was an African, and his mother a noble Roman lady. He was proclaimed emperor by the legions, on the assassination of Probus, 282. He caused justice to be executed upon the assassins. He gained a signal victory over the Sarmatians, and prosecuted the war against the Persians. Undertaking the campaign in mid-winter, and making a rapid march through Thrace and Asia Minor, he ravaged Mesopotamia, made himself master of Seleucia, and carried his arms beyond the Tigris.

CARUS, Paul, American philosophical writer: b. Ilsenburg, Germany, 1852, July 18. He was educated in the universities of Strassburg and Tübingen, and has been a resident of Chicago for several years, where he is editor of *The Open Court* and *The Monist*. He has published: *The Ethical Problem; Fundamental Problems; The Soul of Man; Primer of Philosophy; Truth in Fiction; Monism and Meliorism; The Religion of Science; The Philosophy of the Tool; Our Need of Philosophy; Science: a Religious Revelation; The Gospel of Buddha; Kanna; Nirvana; Homilies of Science; Chinese Philosophy; The Idea of a God; Buddhism and Its Christian Critics; The Dawn of a New Era; Kant and Spencer; The Nature of the State; The History of the Devil; Whence and Whither; Eros and Psyche; Goethe's and Schiller's Xenions; The Crown of Thorns; The Chief's Daughter; Godward; Sacred Tunes for the Consecration of Life; Kant's Prolegomena; The Canon of Reason and Virtue; The Age of Christ; The Surd of Metaphysics; History of the Cross; Greek Mythology;* etc.

CARUS-WILSON, Charles Ashley, Canadian scientist: b. Eastry, England, 1860, Dec. He was graduated at Cambridge (1887) and became a civil engineer. From 1890–8 he was professor of engineering science at McGill University. He has written *Electro-Dynamics*, and many monographs on his science.

CARUTTI DI CANTOGNO, Domenico, *dō-mā'nē-kō kâ-rūt'tē dē kân-tōn'yō*, Baron, Italian historian and publicist: b. Cumiana, near Turin, 1821, Nov. 26. As a young man he took to romance writing, but was speedily

absorbed in politics and rose to great distinction. When he resumed the pen, it was to compile such solid works as *History of the Reign of Victor Amadeus II.* (1856) and *History of the Reign of Charles Emanuel III.* (1859), which are interesting and scholarly.

CARVAJAL, *kâr-vâ-hâl'*, Gaspar de, Spanish missionary: b. Spain early in the 16th century; d. Lima, Peru, 1584. He entered the Dominican order and went to Peru in 1533. In 1538 he accompanied the expedition of Gonzalo Pizarro to the countries east of the Quito as chaplain. He was appointed sub-prior of the convent of San Rosario at Lima; after the pacification of Peru he was sent to the mission of Tucuman, and after working among the Indians there was made vicar-national of the province of Tucuman. With the aid of the Dominicans, whom he brought into the country, he established several Indian towns and Spanish colonies.

CARVAJAL, Tomas José Gonzales, *tō'mâ hō'sā gōn-thâ-lĕz:* Spanish statesman and author: b. Seville, 1753, Dec. 21; d. 1834, Nov. 9. He was appointed in 1795 governor of the new colonies in Sierra Morena and Andulusia, and protested against the French invasion of Spain in 1808. From 1809 to 1811 he served as commissary in the Spanish army against Bonaparte; in 1813 became minister of finance; relinquished these offices to assume the directorship of the royal university of Isidro, where he became involved in difficulties by establishing a professorship of constitutional law. He was arrested and detained in prison from 1815 to 1820, when the revolution reinstated him at San Isidro. A counter revolution brought his opponents into power, and he was exiled from 1823 to 1827. However, at the time of his death he was a member of the supreme council of war, of the military department of the Spanish and Indian boards, and a grandee of Spain. He learned Hebrew at the age of 57 in order to translate the Psalms. This translation has gained for him a high reputation for poetical power.

CARVALHO, José da Silva, *hō'sā dā sēl-vâ kâr-vâl'yō:* Portuguese statesman: b. Beira 1782; d. 1845, Feb. 3. He was a member of the regency and appointed minister of justice until 1823, when, on the downfall of the constitutional government, of which he was a foremost champion, he was obliged to resort to flight to England, where he remained until 1826, when he returned to Lisbon, but Don Miguel's success again compelled him to leave. Eventually he was named a member of the council of guardianship, instituted by Don Pedro for the young queen, Donna Maria, and succeeded in negotiating the first English loan for Portugal. Having accompanied Don Pedro to the Azores, he filled, on his return to Portugal, important offices, and became finance minister in 1832. In 1835 he retired with the Palmella administration, and was presently obliged to retire to England, where he remained until 1838, when a general amnesty was proclaimed.

CARVALHO, Paez de Andrade, Manuel de, *pâ-ĕth' dā ân-drâ dā ma'noo-ĕl dā kâr-vâl'yō*: Brazilian politician: b. about 1795; d. Rio de Janeiro, 1855, June 18. Elected temporary president of Pernambuco in December, 1823, he led a revolt the next year against Pedro I., the emperor, and in 1824, July 2, announced a republic entitled *Confederacao do Equador* On the suppression of the revolt in October, Carvalho fled to England, but subsequently returned to Brazil and was a senator from 1835.

CARVALHOE MELLO: see Pombal.

CARVE, v. *kârv* [AS. *ceorfan;* Dut. *kerven,* to cut or carve; Ger. *kerben,* to notch]: to cut into pieces, as meat; to cut into forms or shapes; to sculpture. Car'ving, imp. N. the act of cutting; the art of cutting figures in wood, etc.; sculpture. Carved, pp. *kârvd.* Carven, pp., antiq. Car'ver, n. one who. Carving-knife, a knife for cutting and slicing meat at table. To carve out, to cut or take out from some large thing; to lay out by design.

CARVEL, n. *kâr'vĕl* [another form of Caravel (q.v.)]: a small ship; a jellyfish. Carvel-built, having the joints of the outer planks in a ship's sides all smooth, edge to edge: see Clincher-built.

CARVER, *kâr'vėr*, John: d. 1621, Apr. 5: first gov. of Plymouth. He left a good estate in England, became an officer of the Rev. John Robinson's church at Leyden, and was sent thence to effect a treaty with the Virginia Co. He obtained a patent 1619, and sailed in the *Mayflower* with the 101 colonists 1620. Arriving at Plymouth, Dec. 21, Carver was unanimously elected gov., and showed ability and prudence in administering the affairs of the infant colony, and in dealing with the Indians, but died four months after landing. He was 'a man of great piety, integrity, and firmness of mind.'

CARVER, Jonathan, American traveler: b. Stillwater, N. Y. (the universal ascription to Connecticut is an error), 1732; d. London, 1780. He embraced a military career, and in the French war of 1756 commanded a company of provincials, in the expedition across the lakes against Canada. When peace was concluded in 1763, Carver undertook to explore the vast territory which Great Britain had gained. His object was to acquire a knowledge of the manners, customs, languages, soil, and natural productions of the nations and region beyond the Mississippi, and to ascertain the breadth of the continent by penetrating to the Pacific over its widest part, between lat. 43° and 46° N. He accordingly set out from Boston in 1766, and having reached Michilimackinac, the remotest English post, applied to Mr. Rogers, the governor, for an assortment of goods as presents for the Indians dwelling in the parts through which his course was to be directed. Receiving a portion of the supply which he desired, and a promise that the residue should be sent to him at the Falls of St. Anthony, he continued his journey. But not obtaining the goods at the appointed place, in consequence

of their having been disposed of elsewhere by those to whom the governor had intrusted them, he found it necessary to return to La Prairie du Chien. He then, in the beginning of the year 1767, directed his steps northwards with a view of finding a communication from the head of the Mississippi into Lake Superior, in order to meet, at the grand portage on the northwest side of that lake, the traders that usually came about this season from Michilimackinac, from whom he intended to purchase goods, and then to pursue his journey. He reached Lake Superior in good time; but unfortunately the traders whom he met there could not furnish him with any goods, as they had barely enough for their own purposes, and, in consequence, he was obliged to return to the place whence he first departed, which he did in 1768, October, after remaining some months on the north and east borders of Lake Superior, and exploring the bays and rivers that empty themselves into that body of water. He soon after repaired to England with the view of publishing his journal and charts, and of obtaining reimbursement for the expenses which he had incurred. Having undergone a long examination before the lords commissioners of trade and plantations, he received permission to publish his papers; but when they were nearly ready for the press an order was issued from the council-board, requiring him to deliver immediately into the plantation office all his charts and journals. He was, consequently, obliged to re-purchase them at a great expense from the bookseller to whom he had disposed of them—a loss for which he received no indemnification, but was forced to be satisfied with that obtained for his other expenses. He had fortunately kept copies of his papers, and he published them 10 years afterward in Boston, while in the situation of a clerk of a lottery. He died in want of the common necessaries of life in 1780, aged 48 years. His works are: *Travels Through the Interior Parts of North America* (1778); *Treatise on the Culture of the Tobacco Plant* (1779).

CARVING: subordinate branch of sculpture, performed usually on ivory or wood. Ivory was the favorite material for this purpose in the east from an early period. Among the Babylonians, who likewise practiced gem-engraving to a great extent, carved heads for staves were executed in vast quantities, as every Babylonian carried a staff and a signet-ring. During the palmy days of Grecian art, ivory was largely employed; the nude portion of the colossal statues of the gods being composed of some solid material overlaid with plates of ivory, while the remaining portions were of plate gold. At a later period, ivory was chiefly used for small works, usually decorative. During the earliest period, statues of the gods were generally of wood, painted, gilt, or draped with colored robes, different kinds of wood being appropriated to different divinities. Carvings in ivory form an important branch of early Christian sculpture. Among the most curious of these are the ivory tablets

adorned on the outside with low-reliefs, and in the inside coated with wax for the purpose of writing upon. The chair inlaid with ivory that belonged to Abp. Maximilian in the cathedral at Ravenna, is of this period (546–555). In 803, Charlemagne received two richly-carved doors as a present from Constantinople, but works of the same kind were executed much earlier. Toward the end of the middle ages, the art of carving in wood was brought to a high degree of perfection in Germany. Altars were adorned with carvings of this material, often of large size, and with numerous figures; in general the nude portions were carefully and tastefully colored after nature, and the draperies gilt. Specimens are in the churches at Altenburg, Erfurt, Prague, and in some churches in Pomerania. The finest and most perfect specimens are a series of reliefs relating to the doctrine of transubstantiation in the church at Tribsees. Many of the Belgian churches also possess very beautiful examples of wood-carving. Michael Wohlgemuth of Nuremberg, and after him Veit Stoss, were eminent carvers in wood. The wood-carving on the great altar of the cathedral at Schleswig by Hans Bruggemann belongs to the beginning of the 16th c. Many graceful specimens of wood-carving, on a smaller scale, belonging to this period, are in museums. Nuremberg was celebrated for its wood-carvings; but only a few of the many works ascribed to Albert Dürer can be assigned to him with certainty. Portrait medallions, usually cut in box, were in vogue during the early part of the 16th c. The first artist in this line was Hans Schwartz of Augsburg. During the 17th and 18th c. ivory was again extensively employed in crucifixes, crosses and goblets, with relief representations. The most eminent artist is Franz de Quesnoy.

CARY, *kā′rĭ*, Alice: 1820, Apr. 26—1871, Feb. 12: poet: b. Mt. Healthy, O., 8 m. from Cincinnati. Her grandfather, a soldier of the revolution, removed to O. from Conn. She began writing at 18, and drew attention by sketches signed 'Patty Lee' in the *National Era*. With her sister Phœbe she published *Poems* (1850), but most of its contents were her own. It was followed by *Lyra and other Poems* (1853), a large vol. of *Poems* (1855); *Lyrics and Hymns* (1866); and a *Lover's Diary* (1867). Her muse was pure, graceful, and tender, but some preferred her prose to her verse, especially in the three series of *Clovernook* (1851, '53, '54), and *Clovernook Children* (1854). In a similar vein were *Pictures of Country Life* (1857), and *Snowberries* (1869). She wrote also several novels: *Hagar* (1852); *Married, not Mated* (1856); *Holywood* (1856); *The Bishop's Son* (1857). Her last 20 years were spent in New York, in untiring literary labor and much ill-health, lightened by the society of her sister and the affection of many friends.

CARY, Annie Louise: American singer: b. Wayne, Maine, 1842, Oct. 22. She studied in Milan, made her operatic dèbut in Copenhagen in 1868, had a successful European career for three years, and returned in 1870 to the United States, where she won great popularity and

remained, with the exception of one brilliant European tour, until 1882, when she married Charles M. Raymond, and retired from the stage while her voice was still unimpaired. Since then she has sung only in private or for charity.

CARY, ARCHIBALD: American statesman: b. Virginia, about 1730; d. Chesterfield, Va., 1786, September. He early became a member of the House of Burgesses, and in 1764 served on the committee which reported the address to the king, lords, and commons, on the principles of taxation; and in 1770 was one of the signers of the 'Mercantile Association,' which pledged its members to use no British fabrics thereafter, the design being to resist by practical measures the encroachments of the government. In 1773 he was one of the celebrated committee of correspondence by which the colonies were united into one great league against Parliament. When the State government was organized he was returned to the senate, where he presided with great dignity and efficiency. At this time occurred the incident with which his name is most generally connected. The scheme of a dictatorship had been broached, and without his knowledge or consent Patrick Henry was spoken of for the post. In the midst of the general agitation Cary met Henry's half-brother in the lobby of the assembly, and said to him: 'Sir, I am told that your brother wishes to be dictator. Tell him from me, that the day of his appointment shall be the day of his death, for he shall find my dagger in his heart before the sunset of that day.' The project was speedily abandoned. He was a good representative of the former race of Virginia planters, delighting in agricultural pursuits, in blooded horses, and improved breeds of cattle which he imported from England, and attended to with great care.

CARY, EDWARD: American journalist: b. Albany, N. Y. 1840, June 5. He has long been connected with the editorial staff of the New York *Times*. His principal published work is a *Life of George William Curtis* (1894).

CARY, ELIZABETH LUTHER: American writer: b. Brooklyn, N. Y., 1867. She is a daughter of Edward Cary (q.v.), and has published translations from the French of Sarcey and Melchior Vogue. Her own works include *Alfred Tennyson: His Homes, His Friends, and His Work* (1898); *Robert Browning, Poet and Man* (1899); *The Rosettis: Dante Gabriel and Christina* (1900); *William Morris* (1903); *Ralph Waldo Emerson, Poet and Thinker* (1904); (with Jones) *Books and My Food* (1904); etc.

CARY, GEORGE LOWELL: American Unitarian theologian: b. Medway, Mass., 1830, May 10. He was graduated at Harvard College in 1852; and was a professor at Antioch College, 1856–62. From 1862–1902 he was professor of New Testament literature in Meadville Theological Seminary, Pennsylvania, of which he was also president. He has published: *Introduction to the Greek of the New Testament* (1878); *The Synoptic Gospels* (1900).

CARY, Henry Francis: 1772–1844; b. Birmingham: clergyman of the Church of England, known for his admirable translation of Dante. At Oxford, where he entered Christ Church as a commoner, 1790, he was distinguished as a classical scholar, also for knowledge of Italian, French, and English literature. In 1805 he translated Dante's *Inferno*, and in 1814 the whole of the *Divina Commedia*, a translation remarkable not only for its accuracy but for its expressiveness and force. He afterward translated Pindar's *Odes* and Aristophanes's *Birds*, and wrote a series of memoirs, in continuation of Dr. Johnson's *Lives of the Poets*. Cary was vicar of Bromley Abbot's, Staffordshire; and for some years he was asst. librarian in the British Museum. He was buried in 'Poets' Corner,' Westminster Abbey. A memoir by his son was published 1847.

CARY, Phœbe: 1824, Sep. 4—1871, July 31; sister of Alice Cary; b. near Cincinnati. Her *Poems and Parodies* appeared 1854, her *Poems of Faith, Hope, and Love* 1867. Her talent was supposed to be nowise inferior to her sister's, and marked by 'more variety, spirit, and humor.' She is remembered chiefly by the lyric, *One Sweetly Solemn Thought*, written, not, as generally stated, 'at the age of seventeen,' but 'one Sabbath morning in 1852, on her return from church.' Exhausted by the strain of her sister's long illness and grief at her loss, she died a few months afterward at Newport, R. I. A monument to Alice and Phœbe was erected by their friends, headed by Horace Greeley, over their remains in Greenwood cemetery. A sketch of the two was written by M. C. Ames, 1873.

CARY, Sir Robert, Earl of Monmouth: b. 1559 or '60; son of Henry Cary, Lord Hunsdon: rose to eminence in the civil service of Queen Elizabeth. For a number of years he acted as English warden on the marches. As a courtier he was present at the death of Elizabeth, 1603, and expeditiously rode on horseback to Edinburgh to communicate the intelligence to her successor, James VI. At the coronation of Charles I., he was elevated to the peerage as Earl of Monmouth. At his death without male issue the earldom became extinct. Sir Robert Cary wrote his *Memoirs* (Edin. 1808), a work interesting chiefly from notices connected with border history.

CARY, Samuel Fenton: American politician: b. Cincinnati, Ohio, 1814, Feb. 18. He represented Ohio in Congress in 1867–9; was the only Republican representative to vote against the impeachment of President Johnson; and was an unsuccessful candidate for Vice-President in 1876, on the Independent, or so-called 'Greenback' ticket headed by Peter Cooper.

CARY REBELLION, in North Carolina, an outcome of the religious and political disturbances set going by the constitution of Locke and Shaftesbury, whose laws and discriminations survived itself. One of these, requiring an oath to support the constitution and laws, debarred the Quakers (who were among the most influential of the

early settlers, and by no means inclined to submit peaceably to oppression) from voting or holding office, or being witnesses in criminal suits. The establishment of and taxation for the Church of England was a common grievance to all the colony, nearly all its population being dissenters; and there were other obnoxious ordinances. At this time Albemarle county (North Carolina) had its separate deputy governor, appointed by the governor of the entire colony; and in 1704 Sir Nathaniel Johnson so appointed Robert Daniel, a churchman, and 'landgrave' or hereditary noble and councilor. He tried to enforce the laws; and one John Porter, an influential Quaker, shortly went to England to complain of him and of vexatious legislation against his sect. One of the proprietors, John Archdale, ex-governor, was himself a Quaker, and induced the other proprietors to remove Daniel; and Johnson appointed Thomas Cary, a Carolina merchant, said to have been Archdale's son-in-law, in his place. Cary, however, felt bound to enforce the laws, and again the Quakers complained. Cary was removed (the accepted account says he was in ill-odor with the proprietors for having been short in his accounts as collector of revenue for them); and this time the appointment of a deputy for Albermarle was taken from the governor, and a new proprietary council formed, with Porter and several other Quakers on it. On Porter's return to America in 1707, he convened the council, which elected William Glover, a churchman, president. Glover insisted on enforcement of the laws as before, and Porter's party turned against him, declared his election illegal, struck a bargain with Cary, and elected him president in Glover's place. Glover and his section refused to recognize the validity of the new election, and held their meetings in one room of the executive mansion, while Cary and his councilors met in the other. Daniel, as a landgrave, was *ipso facto* a councilor, and sat alternately in both. Each party issued writs for election to the assembly, and it seems to have been held without formal recognition of either; but Cary's party held the majority. In 1710 Edward Hyde, a relative of Clarendon's, was appointed deputy-governor by the proprietors, and came out in August, 1710, to assume office. His commission was to be taken from Tynte, who had succeeded Johnson; but Tynte had died, and Hyde had only his letters from the proprietors to show. The Cary party, however, was glad to acknowledge him so long as it held the power and he confirmed it; but the next Assembly was held by its enemies. Hyde apparently aided it in enforcing the laws in favor of the Church, and Cary's party promptly refused to acknowledge his authority and made open war on him. Cary attacked Edenton with two armed vessels, but was repulsed, and Hyde called on Gov. Spotswood of Virginia for help. Spotswood admitted that the revolters were 'dangerous incendiaries', but said the country was almost inaccessible, and he had only militia; but finally he sent some of his

marines from the guard-ships at Hampton Roads. Cary, with his chief men, Levy, Truitt, etc., thereupon went to Virginia, apparently for temporary refuge, declaring that they would go to England and appeal to the proprietors. Spotswood took them at their word and sent them, seemingly against their will, to England; and they disappear from history. That they were discharged, however, is apparent from a circular letter of Lord Dartmouth to the colonies, at this juncture, to send no more prisoners to England for trial without proof of their guilt. At home, the burgesses refused to provide for the defense of the colony unless they could have share in the government and what they held to be their rights; and the result was a fearful desolation in a war which soon broke out with the Tuscaroras.

CA′RYA: see HICKORY.

Caryatis:
From ruins in the Villa Strozzi, on the Appian Road —height, 7 feet 10 inches.

CARYATIDES, n. plu. *kâr′ĭ-ăt′ĭ-dēz* [plu. of *Caryatis*, a woman of *Caryæ*, in Acadia]: in *arch.*, female figures used as columns to support entablatures. CARYATIC, a *kăr′ĭ-ăt′ĭk*, pertaining to. The traditional account of the origin of the name is, that the inhabitants of Caryæ, having joined the Persians after the battle of Thermopylæ, the Greeks, after their victory over the Persians, destroyed the town, slew the men, and carried the women into captivity. As male figures representing Persians were used for this purpose, it occurred to Praxiteles, and other Athenian artists, that female Caryatæ, in their national costume, might be thus employed to commemorate the disgrace of their country. Lessing, and various other writers, have treated this account as fabulous; but it seems confirmed by a bas-relief preserved at Naples, in which two female figures are represented in the attitude of Caryatides, and which has a Greek inscription mentioning the conquest of Caryæ. Male figures used for the same purpose are called Atlantes (q.v.).

CARYL, *kăr′ĭl*, JOSEPH: 1602–73: b. London: Congregational divine. He was a commoner at Exeter College, Oxford, became preacher at Lincoln's Inn, and took part in the affairs of the commonwealth. Parliament directed him to attend Charles I. at Holmby house, and sent him and Owen to Scotland with Cromwell 1650. Ejected 1662, he gathered an independent congregation near London bridge, and served it till death. His *Commentary on Job* appeared 1644–66 in 12 vols. quarto, and 1669 in two folios.

CARYOCAR, *kăr′ĭ-ō-kâr:* genus of large trees of the nat. ord. *Rhizobolaceæ*, and almost constituting the whole order. They are natives of Guiana and Brazil, and are

sometimes called *Pekea* trees. They yield good timber for ship-building, and produce the delicious nuts called *Butter nuts* or *Souari nuts*. The fruit is a sort of drupe, containing several combined nuts. The fleshy part of the drupe consists of a butter-like substance, which melts between the fingers, and is used in cookery instead of butter, on which account these trees are sometimes called *butter-trees*. It forms merely a thin covering for the nuts, the bristles on the outer surface of which, in some of the species, sting like the hairs of the nettle, and are very troublesome to those who open them. The kernels are remarkably soft. An oil is extracted from them scarcely inferior to olive oil. *C. nuciferum* is now cultivated in the island of Saint Vincent; but *C. butyrosum*, *C. glabrum*, *C. tomentosum*, and other species appear equally worthy of attention.

CARYOPHYLLACEÆ, *kăr-ĭ-ō-fĭl-lā'sē-ē:* natural order of exogenous plants, containing upward of 1,000 known species, mostly herbaceous plants, a few half shrubby. The stems are tumid at the articulations; the leaves always opposite and entire, often uniting around the stem. The flowers are regular; the calyx persistent, of 4–5 sepals, either free or united into a tube; the corolla of 4–5 petals, which are frequently bifid, and generally terminate in a claw at the base, sometimes lacking; the stamens as many, or twice as many, as the petals; the ovary of 2–5 carpels; the stigmas sessile; the fruit is a one-celled capsule, with central placenta, to which the seeds are attached.—The plants of this order are natives mostly of temperate and cold countries; some are found only on tropical mountains, near the limit of perpetual snow. Most of them are inconspicuous weeds: some produce beautiful flowers; almost all are insiped and inert; a few contain *saponine*, and afford a substitute for soap: see SOAPWORT. To this order belong the pink, carnation, sweet William, lychnis, chickweed, etc.

CARYOPHYLLIA, n. *kăr'ĭ-ŏ-fĭl'lĭ-ă* [Gr. *karŭŏphullon*, a clove—from *karŭŏn*, a nut; *phullon*, a leaf—*lit.*, clove-shaped]: in *geol.*, a section of lamellated flower-like corals. CAR'YOPHYLLA'CEOUS, a. *-lā'shŭs*, in *bot.*, pink-like, applied to corollas of five petals with long claws. CAR'YOPH'YLLIN, n. *-ŏf'ĭl-lĭn*, a crystalline substance extracted from cloves.

CARYOPHYLLUS: see CLOVES: MYRTACEÆ.

CARYOPSIS, n. *kăr'ĭ-ŏp'sĭs* [Gr. *karŭŏn*, a nut, a kernel; *opsis*, sight, form]: in *bot.*, a dry, one seeded, indehiscent fruit, in which the seed and pericarp are so incorporated as to be inseparable, forming a single grain—as in wheat, barley, rye, maize, etc.

CARYOTA, *kăr-ĭ-ō'ta:* genus of palms, natives of the East Indies, one of which, *C. urens*, remarkable for the acridity of its fruit, which produces a burning sensation when its pulp is applied to the skin, is highly valuable for the great quantity of juice (*toddy*) which flows from its wounded spathes, sometimes in the hot season, to the

amount of 100 pints in twenty-four hours from a single tree. Sugar (*jaggery*) is made from this juice by boiling it down, whence this palm is sometimes called the jaggery palm. The pith of old trees, or farinaceous part of the trunk, is also much used for food, and is said to be equal to the best sago. The outer part of the stem is very hard, and applicable to many purposes. The fibres of the leaf-stalks are made into ropes, which are very strong and durable; the leaf-stalks, merely stripped of the leaflets, are used as fishing-rods, being light, tapering, and elastic; and the woolly substance found at their base is sometimes used for calking ships. This palm is found in India and Ceylon, and abounds chiefly in mountainous districts. It rises to a height of 60 ft., with a trunk of a foot in diameter, and a magnificent spreading head of great double pinnate leaves, and triangular leaflets, the apex of the triangle being their point of attachment.

CARYSFORT REEF, *kăr'ĭz-fōrt rēf:* dangerous coral reef near the s. extremity of Fla.; lat. 25° 13′ n., long. 80° 13′ w.; on the edge of the Gulf Stream. It has an iron lighthouse with a revolving light 166 ft. above the sea.

CASA: prefix frequent in Italian and Spanish names; meaning *house, home.*

CASABIANCA, *kâ-zâ-be-ân'kâ,* Louis: about 1755—1798, Aug. 1; b. Bastia, Corsica. He entered the navy when a boy, embraced the principles of the Revolution, was elected to the national convention, voted for the imprisonment of Louis XVI. and not for his death, and was a member of the Council of Five Hundred. As captain of *L'Orient,* Admiral Brueys's flag-ship, he went to Egypt in the fleet conveying Bonaparte and the army. In the action of Aboukir Bay his powder magazine exploded, his ship was burned, and he perished with his son, a boy of ten. The name has been made famous by a ballad of Mrs. Hemans, which pathetically improves upon the tragic facts. The family is still prominent in Corsica.

CASACALENDA, *kâ-sâ-kâ-lĕn'dâ:* town of Italy, province of Compobasso, 17 m. n.e. of Campobasso, on the site of the ancient Calela. Fruits and wine of good quality are produced in the district, where silk-worms are also reared. Pop. 6,900.

CASALE, *kâ-sâ-lā:* city of n. Italy, province of Alessandria, on the right bank of the Po, which is here crossed by an iron bridge, 38 m. e.n.e. of Turin. It is a place of considerable antiquity, and occupies the site of a more ancient town. Many Roman remains are found, and coins of the early ages of the republic. It has a cathedral, dating from the 8th c., with valuable archives. The old citadel, founded 1590, was one of the strongest in Italy, and within recent years the fortifications have been greatly strengthened and extended. During the Italian campaign of 1859, C. was occupied by divisions of the Sardinian army, and for a short time was the headquarters of the French emperor. It has manufactures of silk-twist, and

a trade in the produce of the district, which is very fertile. Pop. 32,000.

C. formerly gave its name to a province of about 350 sq. miles, with a pop. abt. 143,000.

CASAL-MAGGIORE, *kâ-sâl'mâd-jō'rā:* town of n. Italy, province of Cremona, on the left bank of the Po, 22 m. e.s.e. of Cremona. Being subject to frequent inundations from the river, strong embankments have been constructed for its protection. It has manufactures of earthenware, leather, glass, etc. Pop. 15,648.

CASAL-PUSTERLENGO, *kâ-sâl'pôs-tĕr-lĕn'gō:* town of n. Italy, province of Milan, 12 m. s.e. of Lodi, on the road to Cremona. It has manufactures of silk fabrics, linen, and earthenware, and extensive trade in Parmesan cheese, which is here manufactured of the best quality. Pop. 5,600.

CASAMASSIMA, *kâ-sâ-mâs'ē-mâ:* town of Italy, province of Bari, 14 m. s.e. of the city of Bari. It has a convent and two abbeys, and the vicinity produces wine and almonds. Pop. 7,600.

CASANOVA, *kâ-zâ-no'vâ,* Francis: 1732–1805; b. London, of Venetian parents: painter of battles and landscapes. Educated in Italy, he afterward went to Paris, from which he was driven by the severe criticism of Diderot. C. then took up his abode in Dresden, where he painted chiefly battle-pieces, and by one of his greatest works gained a place in the Academy. He afterward went to Vienna, and painted for the Empress Catharine her victory over the Turks. He died at Briel, near Vienna. The execution, especially the coloring of his works, is excellent.

CASANOVA DE SEINGALT, *dĕh sĭn'gâlt,* or *dĕh săngâlt',* Giovanni Jacopo: 1725–1803; b. Venice: adventurer of the Cagliostro species. He studied in Padua, afterward in Venice, intending to be a priest. Having been expelled for sufficient reasons from a seminary of priests, he travelled to Naples, visited Rome, and after many adventures, arrived in Constantinople. On his return to Venice, 1745, he supported himself for a time by his skill as a violinist, until he gained some celebrity by curing a senator who had been attacked by apoplexy. His irregularities again drove him from Venice, and he wandered about for some time among the chief cities in the n. of Italy, Milan, Mantua, Verona, Ferrara, Bologna, Parma, etc., but in 1750 he went to Paris, where he was patronized by the nobility, and became acquainted with several eminent authors. His peregrinations were endless and inexplicable. He visited almost every European capital, was somehow introduced to the best company, invariably excited the disgust or ill-will of those who knew him, and had always to 'vanish' after a brief period of enjoyment. In 1761, he appears as distinctly professing the miraculous after the Cagliostro fashion; having undertaken to regenerate old Madame D'Urfé, into a young man—for a pecuniary consideration. He died in Bohemia. His celebrated memoirs, *Mémoires écrits par Lui-même* (12 vols.,

Leip. 1826–38), contain many interesting notices of the manners of his times, intermixed with details of his personal adventures.

CASAREEP, or CASSIRIPE, *kăs'sa-rēp:* sauce or condiment made from the juice of the bitter cassava or manioc root. It is of the highest esteem in Guiana, where it is used to flavor almost every dish; and it is the basis of the favorite West Indian dish called *pepper-pot.* It is a powerful antiseptic, and meat can by means of it be kept for a long time quite fresh, even in a tropical climate. It is made by evaporating and concentrating the juice, which is also mixed with various aromatics. The poisonous principle of the juice is dissipated in the evaporation, so that although the juice in a fresh state is readily fatal to life, the C. is perfectly safe and wholesome. C. is imported into Holland and Britain, and remains unimpaired in quality for several years.

CASAS GRANDES, *kâ'sâs grân'dĕs* [Sp., great houses]. town of Mexico, province of Chihuahua, on the C. G. or San Miguel river, abt. 35 m. s. of Llanos and 150 m. n.w. of the city of Chihuahua. It derives its name and note from ruined buildings, supposed to be of an aboriginal race. These were constructed of sun-dried blocks of mud and gravel, abt. 22 in. thick and usually 3 ft. long. The walls are in places 5 ft. thick, and appear to have been plastered. The chief building is 800 ft. long by 200 wide, and seems to have been three separate edifices united by galleries. The rooms were of all sizes; the walls are still 50 ft. high in parts, and indicate that there were probably six or seven stories. 450 ft. away are the remains of a smaller building with rooms ranged round a square court. The district contains many artificial mounds, in which are found stone axes, grinders or *metates,* and earthen vessels, ornamented with colors, and superior to the modern pottery of that region. Similar ruins are near the Gila and the Colorado: Squier supposed them to have been built by the Moquis.—Pop. of C. G., 4,000.

CASAUBON, *ka-saw'bon,* or *kâ-zō-bōng',* ISAAC DE: 1559, Feb. 8—1614, July 1; b. Geneva: scholar and critic. In 1582, he was appointed prof. of the Greek language at Geneva. Subsequently he held professorships at Montpellier, 1596, and at Paris, 1598; but the death of Henry IV. rendered his position (C. being a Protestant) very insecure, and he therefore gladly accepted the offer of Sir Henry Wottan to visit England. King James received him with distinction, and appointed him, some time after, prebendary of Canterbury and Westminster. He died in London. His acute investigation and criticism were applied to several branches of archæology and theology. Among his chief works are the able dissertation, *De Satirica Græcorum Poësi et Romanorum Satira* (1605), the treatise *De Libertate Ecclesiastica* (1607), and the *Exercitationes contra Baronium* (1614), a confutation of Cardinal Baronius. His critical and exegetical works include editions of Diogenes Laertius, Aris-

totle, Theophrastus, Suetonius, Persius, Polybius, Theocritus, Strabo, etc.—See *Isaac Casaubon*, by Mark Pattison (1875).

His son, MERIC C., 1599, Aug. 14—1671, July 14, was born at Geneva, and educated first at Sedan. He accompanied his father to England, and entered Christ Church College, Oxford, where he took his degree of M.A. 1621. He was appointed rector of Ickham, near Canterbury, 1628, and afterward professor of theology at Oxford, where he died. His attachment to Charles I. deprived him of all his preferments during the commonwealth, but at the restoration he received them again. Meric was, like his father, distinguished for erudition; edited the works of Marcus Aurelius Antoninus, Terence, Epictetus, etc.; and wrote a treatise, *De Enthusiasmo* (Lond. 1655).

CASAVA, or CASSAVA, n. *kă-sâ′vă* [Sp. *cazabe*]: bread made from the starch obtained from the root of the cassava (q.v.) or manioc plant; the two varieties are named sweet cassava and bitter cassava—from the root of the latter tapioca is prepared; the *Janĭpha manĭhot*, ord. *Euphorbĭācĕæ*.

CASCABEL, or CASCABLE, n. *kăs′kă-bl* [Sp. *cascabel*, a little bell]: in *mil.*, the portion of a smooth-bore gun lying between the base ring and the rear or butt end.

CASCADE, n. *kăs-kād′* [F. *cascade*—from It. *cascata*, a fall of water—from It. *cascare*, to fall]: a waterfall.

CASCADE RANGE of mountains: see WASHINGTON.

CASCALHO, n. *kâs-kăl′yō* [Port. *cascalho*, gravel]: a name given in Brazil to the gravelly deposit in which diamonds are found.

CASCARA SAGRADA: the bark of a northwestern tree (*Rhamnus Purshiana*, or California buckthorn), of the natural order *Rhamnaceæ*. The composition of cascara is extremely complex, but its main action is due to the volatile oils, the anthracene resins, at least three, the amaroids, and the tannin. It stimulates peristalsis, increases the intestinal juices, and has marked effects on general excretion. It is an excellent laxative, and one of the very best cathartics for habitual and chronic constipation. It is best used in the form of a fluid extract. Because of its valuable properties, many patent drugs with similarly sounding names have been foisted on the public. These mostly contain other and more powerful and pernicious cathartics. See BUCKTHORN.

CASCARILLA, *kăs′kă-rĭl′lă* ['little bark; Sp. *cascara*, bark of trees]: name in S. America for many different kinds of bitter medicinal barks, including Peruvian bark itself; and the name Cascarilla is used for a subdivision of the genus *Cinchona* (q.v.). In Europe, the name C. Bark (*cortex cascarillæ*) is given to the bark of the *Croton Eleutheria* (see CROTON), a small tree, native of the West Indies, especially Jamaica, where it is known as the *Sweet-wood* and the *Sea-side Balsam*—being used in making incense (q.v.) and

pastils. It is imported in considerable quantities into Europe from the Bahama Islands, and appears in commerce in small thin fragments and in quills. It is sometimes used as a substitute for cinchona, although inferior in tonic and febrifuge qualities. It is a favorite medicine in Germany.—The barks of a number of other species of *Croton* appear to possess properties similar.

CASCO BAY, *kăs'kō:* indentation abt. 20 m. wide, into which Portland harbor opens, on the s.w. coast of Me. Cape Elizabeth is its w. headland. Many hundreds of islands and islets make the bay very picturesque. It is a favorite summer resort.

CASE, n. *kās* [F. *caisse*, a box: It. *cassa*, a chest: Sp. *casco*, a cask: Dut. *kast;* Ger. *kiste*, a chest: L. *capsa*, a box; *cassus*, hollow]: a hollow thing; a covering; a box; a sheath; a frame; a certain quantity: V. to cover in; to put in a case or box. CA'SING, imp.: N. a covering. CASED, pp. *kāst.* CASE-HARDEN, v. *-hâr'dn*, to harden the outer part—as iron, by converting it into steel. CASE-HAR'DENING, imp. CASE-HAR'DENED, pp.: ADJ. *familiarly*, lost to all sense of honor or shame. CASE-KNIFE, a long kitchen-knife. CASE'WORM, n. caddice-worm; a worm or grub which makes itself a case. CASE-SHOT, bullets in a case, which bursts and scatters the bullets on leaving the gun; same as canister. CASE'MAN, n. a compositor.

CASE, n. *kās* [F. *cas*, a case, a matter—from L. *casus*, a fall]: that which falls, comes, or happens; an event; condition or state in which any person or thing may chance to be; a question for discussion; a cause in a court; the inflection of nouns. IN CASE, if it should so happen. IN GOOD CASE, in good condition or health of body.

CASE, in Grammar: see DECLENSION.

CASE, in Legal Phraseology: often used as synonymous with cause, but having separate though not always very definite meanings. A formal written argument, prepared with a view to obtaining the opinion of a court of law, is called a case.

CASE, in Letter-press Printing: receptacle for types, generally 32½ inches long, 16½ inches broad, and 1¼ inch deep, and divided into compartments or 'boxes,' each of which contains types of one class or letter. A pair of cases consists of an upper and a lower case: the upper one has 98 'boxes,' and contains the capitals, small capitals, and some other letters only occasionally required in composition; the lower one has 54 'boxes,' and holds the letters of the small character, figures, spaces, and most of the points. The places assigned to the several letters of the alphabet in the boxes of the case are not precisely the same in all printing-offices, but the differences are few. The accompanying illustration shows a prevalent arrangement. When in use, the cases lie on a frame four ft. high, and the compositor stands in front of them. The different sizes of the boxes in the lower case depend upon the comparative frequency in

which the several letters occur in composition, and the position in the case allotted to each letter is such as to afford the greatest facility in composing. The letter *e*, which is most run upon in the English language, has a box much larger than any of the other compartments, and is placed directly

Upper Case.

*	†	‡	§	‖	¶	☞	¼	½	¾	⅛	⅜	⅝	⅞
						£	-	~	3m br'c		⁀	⁀	⁀
&	Æ	Œ	æ	œ		$	—	—	3m d'sh	Æ	Œ		&
A	B	C	D	E	F	G	A	B	C	D	E	F	G
H	I	K	L	M	N	O	H	I	K	L	M	N	O
P	Q	R	S	T	V	W	P	Q	R	S	T	V	W
X	Y	Z	J	U	[	(	X	Y	Z	J	U	h'ir sp.	ffl

ffi	fl	5m sp.	4m sp.	'	k		1	2	3	4	5	6	7	8
j / !	b	c		d		e	i		s		f	g	ff / fl	9 / 0
? / z	l	m		n		h	o		y	p	w	,	n qd.	m qd.
x / q	v	u		t		3m spaces	a		r		; / .	: / -	quads	

Lower Case.

in front of the compositor. In the upper case the boxes are of uniform size, and the letters are placed in alphabetical order, the comparatively rare occurrence of capitals rendering it immaterial which letter is nearest the compositor's hand. A case will hold a quantity of 'letter' sufficient to 'set up,' about five pages of this work, equal to about 16,000 types.

CASE, William: 1780, Aug. 27—1855, Oct. 19; b. Swansea, Mass.: missionary. He was admitted to the N. Y Meth. Epis. Conference 1805, and was presiding elder in central and w. N. Y., and in Canada, 18 years. From 1828 he was supt. of the M. E. Indian schools and missions in Canada, gaining a dominant influence over Canadian Methodism, and the name of 'Apostle to the Canada Indians.' He died at Alnwick mission house.

CASE-HARDENING: process of converting the surface of certain kinds of malleable-iron goods into steel, thereby making them harder, less liable to rust, and capable of taking on a better polish. Fire-irons, portions of fine grate-fronts, gun-locks, and other articles of limited size, are very

commonly so treated, but the process is sometimes applied to large objects, such as rails for railways. The articles are first formed of bar iron, and being heated to redness, are sprinkled with a little powdered yellow prussiate of potash, and heated again. The result is, that the heat decomposes the prussiate of potash, and the liberated carbon combines with the iron, forming a coating of steel on the surface. Another mode of C. is to heat the articles along with some animal matter, such as the parings of horns and a little common salt, from one-half hour to several hours; the articles are then cooled in cold water, or in oil if of a delicate nature. Charcoal alone also is used. The coating of steel is very thin, seldom exceeding $\frac{1}{16}$th of an inch. Where it is wanted to be thicker, the articles are treated several times. A Swedish iron-master has found that a very excellent case-hardening is obtained by treating iron objects with a mixture of animal matter and arsenious acid dissolved in hydrochloric acid, and heating as usual.

CASEINE, n. *kā′sē-ĭn* [L. *casĕŭs*, cheese]: the cheesy portion of the curd of milk; the proteid constituent of milk. Ca′seous, a. *-ŭs*, like cheese; having the qualities of cheese. Ca′seic, a. *-ĭk*, of or from cheese.

CA′SËINE, or Caseum: a substance resembling albumen in its general properties, and obtained from milk. The older chemists gave the name 'casein' both to the precipitated substance that is now known by that name, and to the corresponding substance as it exists in solution in the milk; but it is usual at the present time to distinguish the latter as 'caseinogen.' Caseinogen is the principal nitrogenous constituent of milk, and is precipitated as a curdy mass when acetic acid or a mineral acid is added to milk that has been previously diluted by the addition of its own bulk of water. If the caseinogen so prepared is made into a paste and then treated with a small quantity of rennet, the mass sets at once into a solid clot, consisting of true casein; but Hammarstein has shown that if the caseinogen is first washed entirely free from calcium phosphate, rennet is without action upon it. The precise function of the calcium phosphate is obscure, and the same may be said of the chemical relations of the proteids in general. If rennet is added to fresh milk a bulky deposit of casein comes down immediately; but to obtain the casein in pure form, the oily matters in the milk should be first removed by the action of a centrifugal separator, and the casein, after precipitation, should be compressed so as to expel as much of the whey as possible. Some chemists have recently given the name paracasein to the rennet precipitated casein, restricting the term casein to the acid precipitate. Paracasein differs from casein in its coarser, less flaky appearance, and in being less easily soluble than the acid precipitated casein. Caseinogen is not precipitated by heat, nor does it (like fibrinogen) coagulate spontaneously. The coagulation observed when milk is boiled

is due to the albumen present, and not to the casein; and that which occurs upon standing may be due either to the generation of lactic acid through the fermentation of the lactose present, or to the rennet-like action of the ptomaines liberated by micro-organisms that happen to fall into the milk from the air. According to the analyses of Chittenden and Painter, the elementary percentage composition of casein is as follows: Carbon, 53.30; hydrogen, 7.07; nitrogen, 15.91; sulphur, 0.82; phosphorus, 0.87; oxygen, 22.03. Casein is insoluble in water, but dissolves easily in alkaline solutions. It also dissolves in very weak hydrochloric acid, from which it is again precipitated upon the addition of the same reagent in more concentrated form.

The form of casein obtained from plants, and termed legumine, is generally procured from leguminous seeds, like peas or beans, though it can be extracted also from the majority of vegetable substances, especially from sweet and bitter almonds, and even from tea and coffee. Dried peas contain a fourth of their weight of legumine, and this can be extracted by bruising the peas to powder, and digesting in warm water for two or three hours. The liquid is then strained through cloth, which retains the insoluble matters, and allows the water with the legumine dissolved therein, and with starch mechanically suspended, to pass through. On settling, the starch falls to the bottom of the vessel, and the clear liquid holding the legumine in solution, on the addition of a small amount of acetic acid, yields a precipitate of legumine or vegetable casein. So perfectly does the vegetable casein resemble the casein from milk, that the one can hardly be distinguished from the other by chemical tests or by taste.

CASEMATE, n. *kās′māt* [F. *casemate*, a casemate, a loop—from It. *casamatta*, a casemate—from Sp. *casamata*—from *casa*, a house; *matar*, to slay]: originally a loop-holed gallery excavated in a bastion, from which the garrison could do execution upon an enemy who had obtained possession of the ditch, without risk of loss to themselves. Hence the designation, from Span. *casa*, house, *matar*, to kill. As defense from shells became more important, the term was subsequently applied to a bomb-proof vault in a fortress, for the security of the defenders, without direct reference to the annoyance of the enemy. A *casemated* battery consists of such a vault or vaults, with openings for the guns. A casemate may also serve for barracks, or for a hospital, or for a store-house. The great want of ventilation in casemates renders them bad places for barracks; and the artillerymen are nearly stifled with smoke when firing from such confined places.—CASE′-MATED, a. having casemates.

CASEMENT, n. *kās′mĕnt* [a mere abbreviation of *encasement*—from *encase*—from OF. *encasser*, to case or put into a chest: comp. It. *casamento*, a large house]: frame with hinges to open and shut, inclosing part of the glazing of a window. Windows of this description are not very

common in the United States and in Britain, but are almost universal on the European continent; sometimes called French windows. Casement is also a name for a deep, hollow circular molding, similar to the *scotia* of classical and the *cavetto* of Italian architecture; prevalent in the perpendicular style of Gothic architecture, and sometimes enriched with running foliage. CASEMENTED, a. having casements.

CASEOUS, a.: see under CASEINE.

CASERN, or CASERNE, n. *kā'zėrn* [F. *caserne*, barracks —from Sp. *caserna*—from L. *casa*, a hut]: a small sleeping-place for soldiers near the ramparts.

CASERTA, *kâ-sār'tâ:* town of Italy, province of Caserta; on a plain about 17 m. n.e. of Naples; noted chiefly for its magnificent palace, one of the finest in Europe, formerly the frequent residence of the Neapolitan court. During 1860, Caserta acquired celebrity as the headquarters of Garibaldi and his army. A royal silk manufactory has been established in the neighborhood. Pop., with adjoining hamlets (1881), 17,257; (1901) 32,709.

CASE-SHOT, as the name implies, is a collection of balls contained in a case, envelope, or form, generally so arranged as to break in flight, freeing the particles in order to produce the most destructive effects. Case-shot may be divided into (1) Grape; (2) Canister; and (3) Shrapnel.

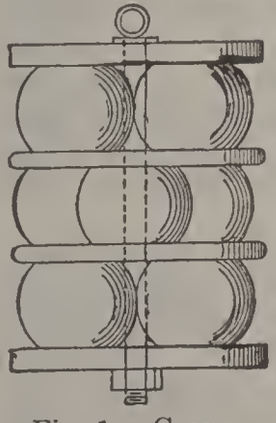


Fig. 1.—Grape.

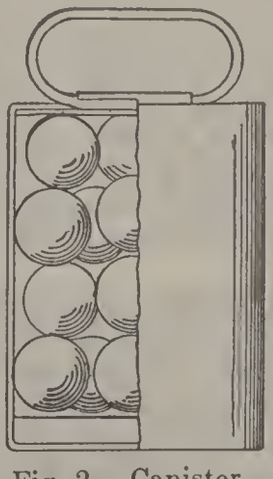


Fig. 2.—Canister.

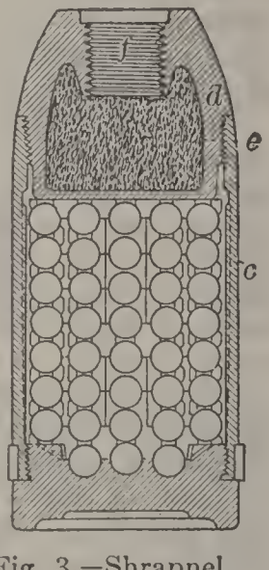


Fig. 3.—Shrapnel.

Grape, now obsolete, consisted of nine balls in three layers each, enclosed between two plates, with a central bolt, the layers being divided by two intermediate rings (Fig. 1). This projectile was fired from smooth-bore guns and used both on land and sea against masses of men, the masts and rigging of ships, at distances where lighter forms of Case-shot would not be effective.

Canister consists of spherical bullets contained in a can, (Fig. 2), from which the name is taken. It is closed at the top and bottom with plates of iron. This projectile

is intended for the use of mountain guns at short ranges. The case is ruptured in the gun and the projectiles are dispersed in the form of a cone on emerging therefrom. They are practically obsolete, being very rarely used in modern guns.

Shrapnel, named after its inventor, Colonel Shrapnel, British Army, has been greatly perfected and is the 'man-killing' projectile for Field Artillery. Its use has become so extended that practically it has excluded most other projectiles in modern warfare and will be used for all mountain, field, and siege guns except one-pounders, and in all seacoast guns up to six inches in calibre. Practically three-fourths of the ammunition for mountain and field guns is to be Shrapnel, the other fourth high explosive shell. Besides Shrapnel will be used largely in siege and seacoast guns. Hence its importance may be appreciated.

This projectile is formed of a metal case, with a quantity of balls varying in the number enclosed, with a bursting charge and fuse. The idea is to give the interior charge sufficient force to rupture the envelope containing the balls at a desired point in its flight, which then disperse, moving with the original velocity from the discharge accentuated by that of the bursting charge, and strike the target in their descent.

This form of projectile is very destructive when exploded at the proper point in front of the line of the enemy. Great accuracy in obtaining the range and elevation is required to produce the best results, which is a point about six yards above and 50 yards in front of the target.

Shrapnel (Fig. 3) consists of a drawn steel tube, *a*, with a base and head of cast-iron (*d* and *h*), the latter containing both the bursting charge (*e*) and fuse (*f*). The bullets (*g*) are held in place by a skeleton matrix of cast-iron. consisting of a plate at top and bottom, and a series of intermediate plates called *separators*. The latter are made in segments, and the head and base plates are then screwed on.

In the construction of Shrapnel great care is necessary. The size of the balls as well as the weight of same is a very important consideration. They should not exceed 50 per cent. of the weight of the entire projectile. At present lead balls are commonly used, and have a diameter of forty-nine hundredths of an inch, weighing about one hundred and sixty-seven grains. The number of balls varies with the calibre of the gun. The 3-inch rifle for the U. S. Field Artillery fires a shrapnel with 262 balls.

In the latest Shrapnel the case is not ruptured as formerly, the bursting charge being placed at the base instead of at the head. In action the head is stripped and the balls shot out of the case with an increased velocity of from 250 to 300 feet per second, due to the bursting charge. It is considered that a bullet with 58 ft.-lb. energy will disable a man, and one with 287 ft.-lb. disable a horse.

CASEY, *kā'sĭ*, Silas: 1807, July 12—1882, Jan. 22; b.

East Greenwich, R. I.: general. He graduated at West Point, 1826, served in Florida and Mexico, gaining brevets for gallantry at Contreras and Chapultepec, and at the latter receiving a severe wound while leading the assault. He was commissioned lieut.col. 1855, col. 4th inf. and brig. gen. of vols. 1861, and was employed in organizing and disciplining volunteers at Washington. He commanded a division in Keyes's corps of the Army of the Potomac, and received the first Confederate attack at Fair Oaks, 1862, May 31: for this he was made maj.gen. of vols., brevetted brig.gen. in the regular army, and afterward (1867) thanked by the R. I. legislature. He was brevetted maj.gen. United States Army, 1866, and retired from active service 1868. He died in Brooklyn. His publications include *System of Infantry Tactics* (1862); and *Infantry Tactics for Colored Troops.* (1863).

CASEY, Thomas Lincoln, American military engineer: b. Sackett's Harbor, N. Y., 1831, May 10; d. Washington, D. C., 1890, March 26. He graduated from West Point in 1852, and entered the engineer corps of the army. During the Civil War he was superintending engineer of defenses on the coast of Maine, and on special duty with the North Atlantic squadron in the first expedition against Fort Fisher. In 1865 he was brevetted colonel for gallant services during the war. In 1868 he was put in charge of one of the departments in the chief engineer's office at Washington; in 1873 was sent abroad for professional service; and in 1877 was placed in charge of the construction of the state war, and navy building, and of the Washington aqueduct, and also of the Department of Public Buildings and Grounds. Later he built the White House conservatory and the Army Medical Museum, completed the Washington monument, and took charge of the construction of the Congressional Library. He was president of the board of engineers for fortifications at New York 1886–8; and was promoted chief of engineers and brig.-gen. in 1888.

CASGRAIN, Henri Raymond: b. Riviére Ouelle, Que. 1831; d. 1906. He was educated at Ste. Anne College and Quebec Seminaire; ordained to the priesthood 1856; was president of the Royal Society in 1889. His chief works were: *Légendes Canadiennes* (1861); *Histoire de la Mère Marie de l'Incarnation* (1864) *Vié des Saints*; 1867); *Legendes et Varities* (1884); *Biographies Canadiennes* (1885); *Histoire de l'Hotel Dieu de Quebec* (1889); *Un Pélerinageau Pays d'Evangeline* (1888); *Montcalm et Levis* (1891); *Wolf and Montcalm* (1905).

CASH, n. *kăsh* [F. *caisse* and *casse;* It. *cassa,* a chest or counter, a merchant's cash—from L. *capsa,* a chest]: money on hand, or at command, as in a chest or in the bank; ready money; sometimes synonymous with money, as distinguished from produce, in which sense it includes all immediately negotiable paper—bills, drafts, and bonds, as coin and bank-notes. Cash, v. to turn into money;

to exchange for money. CASH'ING, imp. CASHED, pp. *kăsht*. CASHIER, n. *kă-shēr'*, a clerk who has charge of the money and the cash-book. CASH-ACCOUNT, an account of advances opened by a banker to a borrower who has given security for the repayment of them CASH-CREDIT, the privilege of drawing money out of a bank on security being given. CASH-BOOK, the book in which money paid out and received is written down.

CASH ACCOUNT', or CASH CREDIT: form of account with a bank, by which a person is entitled to draw out sums as required by way of loan to a stipulated amount. The practice began about 1729 in Scotland, with the banks of which country it is still peculiarly associated; but it is not unknown elsewhere, though on a somewhat different plan. In connection with the Scotch banks, the C. A. system is placed on a distinct and secure basis. The persons procuring a credit of this kind are for the most part retail-dealers, tradesmen, and farmers, who possess a limited capital, and need occasional loans. See MARGINAL CREDIT.

CASHEL, *kăsh'el:* town of Ireland, Tipperary county, 105 m. s.w. of Dublin by rail. It is irregularly built on the s. and e. slopes of an isolated height, rising abruptly from a rich and extensive plain. C. is a bishop's see, and returns one member to parliament. The ancient kings of Munster resided here. The top of the height, or 'Rock of Cashel,' is occupied by an assemblage of the most interesting ruins in Ireland, which have a grand effect from the country around. The ruins consist of a cathedral, the largest and most remarkable in the country, founded 1169, burned 1495, and afterward repaired; a stone-roofed chapel, built 1127 by Cormac MacCarthy, King of Munster, and the most perfect specimen of the kind in the country; Hore Abbey, founded 1260; the palace of the Munster kings; and a round tower, 90 ft. high and 56 in circumference. The round tower is built of freestone, the other ruins of limestone. At C., 1172, the great synod was held in which the Irish prelates first acknowledged the authority of the English king and church. Pop. 5,000.

CASHEW, n. *kă-shō'* [F. *acajou*—from the native name], (*Anacardium occidentale*): tree of the nat. ord. *Anacardiaceæ*, native probably of the tropical parts of both hemispheres, although commonly regarded as of American origin. It is a spreading tree of no great height. It abounds in a clammy, milky juice, which turns black on exposure to the air, and is used in India for varnishing, but is so acrid as to produce painful inflammation when it comes in contact with the skin of some persons, or when they are exposed to its fumes. Others are comparatively unsusceptible of its influence. The fruit of this tree is a kidney-shaped nut, about an inch long, seated on the thicker end of a pear-shaped fleshy stalk, from which the botanical character of the the genus is derived. The shell is double, the outer shell ash-colored, and very smooth; and between it and the inner is a layer of very caustic black juice. The kernel is oily, and very pleasant and wholesome, and is in common use as an article of food

in tropical countries, being made into puddings, roasted, and in various ways prepared for the table. In the West Indies, it is put into wine, particularly old Madeira wine, to which it is thought to communicate a peculiarly agreeable flavor, and for this use it is sometimes exported. It is for the same reason sometimes an ingredient in chocolate. Yet the vapor which arises from it in roasting, but which is derived from the coating of the kernel, and not from the kernel itself, is so acrid as to cause erysipelas and other painful

Cashew Nut (*Anacardium occidentale*).

affections of the face in those who conduct the process, unless great caution is used.—The fleshy stalk, sometimes called the *Cashew Apple*, varies in size, being sometimes not much larger than a cherry, and sometimes as large as an orange, and is white, yellow, or red. It is perfectly free of the acridity characteristic of the natural order, is acid and eatable, very pleasant and refreshing, and much used by the inhabitants of the countries in which the tree grows. A very pleasant vinous liquor is obtained from it by fermentation; and this by distillation yields a spirituous liquor, highly esteemed for its flavor. A gum which exudes from the bark of the tree, quite distinct from the milky juice already mentioned, is bland, and very similar to gum-arabic.

CASHGAR, or KASHGAR, *kăsh-gâr′:* political capital of e. Turkestan, of which khanate—independent of China from 1865–78—Yarkand is the commercial capital. C. stands 140 m. n.w. of Yarkand, lat. 39° 25′ n., long. 73° 57′ e. It is surrounded by an earthen rampart, pierced with four gates, and is strongly garrisoned. It has manufactures of cotton, gold and silver cloths, carpets, etc.; and extensive trade

with central Asia. C. lies in a rich valley, irrigated by one of the head streams of the river Tarim ; its houses are mostly of clay. The city is said to have been an important commercial town before the Christian era. See TURKESTAN. Pop. estimated 80,000.

CASHIER: see under CASH.

CASHIER, v. *kă-shēr'* [Dut. *kasseren*, to cast off, to break : Ger. *cassiren*, to cashier, to annul—from F. *casser*, to break—from L. *quassārĕ*, to break or dash to pieces]: to dismiss from an office of trust for bad conduct ; to reject or discard. CASHIER'ING, imp. CASHIERED, pp. *kă-shērd'*, dismissed; discarded. Cashiering, as a punishment for officers in the army and navy is a severe form of dismissal from the service, and implies that the officer, by some disgraceful conduct, has deserved not only dismissal, but disqualification for ever again entering the service. Sometimes there are words added, implying still deeper ignominy and degradation. On some rare occasions, when a court-martial has awarded C., the commander-in-chief has mitigated the punishment to simple dismissal. 'Scandalous and infamous conduct,' and 'conduct unbecoming the character of an officer and a gentlemen,' mark two degrees of offense which may lead, the one to C., the other to dismissal. *Note.*—Skeat refers the origin of *cashier* also to the F. *casser*, to break, to burst : mid. L. *cassārĕ*, to bring to nothing, to annul—from L. *cassus*, empty, void.

CASHMERE, *kăsh-mēr'*: valley of the Himalaya, between India proper and middle Tibet ; between lat. 33° 15′ and 34° 35′ n., and long. 74° 10′ and 75° 40′ e. Its bottom, a comparative level of about 2,000 sq. m. is about 5,500 ft. above the sea ; while the inclosure, as a whole, from ridge to ridge, besides fully doubling the area, attains, at some points, nearly thrice the altitude. The mountain-wall of this secluded region presents few passes, and most of these too lofty to be practicable in winter. In fact, the Baramula itself does not admit a wheeled vehicle. Through this single opening, at the s.w., the Jhelum carries down toward the Punjab the gathered streams and lakes of the entire basin, and is navigable for the last 70 m. of its course. This network of waters, without swelling into inundations, affords everywhere a perennial supply for irrigation. Besides the copious rains of spring, the snows of winter, covering even the plains to a depth of two ft. for four months, accumulate in every gorge and on every declivity, reservoir above reservoir, against the demands of summer. C. is traditionally believed to have been a vast upland lake, and alluvial deposits beyond the reach of existing influences seem to confirm the supposition.

In regard to climate, moderate but steady frost prevails from Nov. to March; and again, the heat, ranging from 75° in June to 85° in August, is often disproportionately oppressive, through the stagnation of the landlocked atmosphere. The staple production is rice, which, from the singular facilities of irrigation, is an almost sure crop, yielding even in an ordinary season 30 or 40 returns ; and in the

abundance and excellence of its fruits, C. is said to surpass all the rest of the world. The valley is, in general, considered remarkably healthy. The inhabitants, almost universally held to be models of strength and beauty, have suffered much from famine and pestilence. The famine of 1878–9 was very severe, producing terrible mortality and distress beyond description. The people are mostly Mohammedans, divided between the Sunnite and Shiite sects. The manufactures are shawls, leather, firearms, and attar of roses. In 1315, C. first received Mohammedanism; in 1586, it was annexed to the Mogul empire; in 1752, it fell under the power of the Afghans; and in 1819, it was subjugated by the Sikhs. Lastly, being ceded, at the close of the first war of the Punjab, to the British, it was by them transferred to Gholab Sing, prince of Jamu. The maharaja is ruler not merely of C. but of Jamu, Punch, Ladakh (q.v.), Gilghit, Bulti (q.v)., Dardistan, etc.—a total area of 80,900 sq. m. He is politically connected with the Punjab, his relations to other states being controlled by the government of India; but within his own territories he is independent. The revenue of C. is about £550,000; of the whole terrritory, £800,000. The chief towns are Srinagar or Serinagur (q.v.), Jamu (q.v.), Le (q.v.), Islamabad, and Baramula. Pop. of total area above indicated, (1901) 2,905,578.

CASHMERE, n. *kăsh'mēr:* a rich and costly material for shawls: so called from *Cashmere*, the country of northern India where first made; a fine woolen stuff made in imitation of real cashmere: ADJ. of or pertaining to. CASHMERE GOAT, variety of the common goat, remarkable for very long, fine, and silky hair, from which the famous Cashmere shawls are made. It is found not so much in Cashmere, as in Tibet, whence the finest goat-hair is imported into Cashmere, to be there manufactured into shawls. The hair is even longer than that of the Angora goat, and not, like it, curled into ringlets, but straight. It is about 18 inches

Cashmere Goat.

long. A single goat does not yield more than three ounces, and the fleece of ten goats are requisite for the manufact-

ure of a shawl a yard and a half square. The hair is spun by women, and dyed after it is spun. It is said that 16,000 looms are kept in constant employment in Cashmere, producing annually about 30,000 shawls. The shawls are woven in rudely-constructed looms, a pair of shawls sometimes occupying three or four men a whole year in weaving. Cashmere shawls, of the finest quality, are sold in Europe and America at from $500 to $2,000 each. Plain shawls are simply woven in the loom, but those with variegated patterns are worked with wooden needles, a separate needle being used for each color. These shawls are in the highest request in India; but the hair of several other breeds of goat inferior to that of Tibet is employed for the manufacture of shawls called by the same name. Imitations of these are extensively manufactured in France, some from the Tibet wool entirely, and others of a mixture of this with silk and cotton. It is said that 24 pounds of the best Tibetan goat-hair sell in Cashmere for 20 rupees, or about $50.

Attempts have been made to introduce the Cashmere goat into Europe. Baron Alstrœmer attempted, in the end of the 18th c., to naturalize it in Sweden; and a very spirited attempt to introduce it into Great Britain has recently been made by Mr. Towers. A mixed race, produced by crossing the Cashmere goat and the Angora, has been found to possess most valuable qualities, the hair being long, fine, and more abundant than in any of the parent breeds. The male of the Cashmere goat has very large, flattened, wavy horns.

CASH REGISTER: an automatic mechanism for registering money accounts. It is probably the most antique and yet, in its improved form, the most modern appliance known to commerce. The ancients, more than 6,000 years ago, used a registering device, termed an Abacus, for the purpose of indicating visibly to the seller and buyer the amount purchased. The cash register is an absolute necessity. By infallible mechanism it provides not only a correct registration of all the cash received, but at the same time, with the aid of a miniature printing-press, it records or prints the details of each and every transaction that occurs upon a printed strip or tape, thus keeping the proprietor in constant touch with each and every detail of his business, and offering him at a glance, a thousand times a day, if necessary, without the slightest trouble or inconvenience, a diagram of the progress of each department in his store, as well as the industry of each clerk. The miniature printing press attached to the modern cash register also cuts off and issues a printed check or bill, which is handed by the clerk to the customer for payment to the cashier, thus saving a great amount of time and unnecessary labor in writing. The prime object of a cash register is to protect and secure a correct accounting of all the cash received or paid out, and where a credit business is done, to so systematize the accounts as to insure a correct record of the same. The good qualities

of the modern cash register consist in boldly proclaiming or indicating each and every transaction, and correctly recording or transmitting the indication to the adding and printing mechanism, so that the customer, clerks, and proprietor may depend upon a correct accounting of each and every detail of the business. The essentials of such a mechanism have been stated to be: (1) a series of operating keys representing different amounts of money; (2) a registering mechanism upon which the values of the operated keys are added and preserved; (3) an indicating mechanism by which, when any key is operated, an indicating tablet representing the value of such key is exposed to view; (4) an alarm which is sounded by the operation of each key, to call attention to the exposed indication; and usually, (5) a money drawer which is automatically unlocked and thrown open at the operation of any one of the keys. The indicating mechanism gives utility to the machine by compelling the clerk to operate the proper key when he registers each sale. It is the protective element of the machine.

Among the more important improvements which inventors have worked out into practical advantage on a cash register may be named: (1) The totalizing counter, which adds all the registrations into one total. (2) The tape-printer, which prints the amount of each registration. (3) The check-printer, which prints, cuts off, and throws out a check giving the figures of each registration, with the initials of the clerk making the sale. (4) The throw-out counter, which made it possible to print the amounts of all transactions on the detail tape and check which is issued, but prevents any amount, other than cash transactions, being so added into the totalizing counter. (5) A variation of the foregoing, which adapted it to print, instead of a check, an itemized bill, such as is used in the larger stores and offices. (6) The multiple-counter, which provides a separate adding mechanism for each person who operates the machine. (7) The multiple-drawer feature, or a series of cash drawers attached to one machine, giving the equivalent of many machines in one. This feature may be attached to the different types of registers, and gives the advantage of a separate machine for each individual, so that separate records are made not only of the transactions of each, but mistakes of any one of the different number of clerks using it are readily indentified. (8) Distant indication, which is a means for electrically indicating at a distance; namely, in the proprietor's office, home, or front show-window, the sales made as registered on the machine.

Among newer improvements of cash registers are: (1) the application of electricity as a motive power, giving great rapidity of operation and saving of manual work; and (2) the application of cash registering mechanisms to conform to the special requirements of systems of express companies, telegraph companies, banking offices, department stores, post-offices, railroad offices, etc.

CASIA, *kăsh'a*, or *kăsh'ĭa*, or Poet's Casia (*Osyris alba*): shrub of the nat. ord. *Santalaceæ*, native of the s. of Europe, three to four ft. high, with linear-lanceolate deciduous leaves, long, supple branches, numerous small white flowers, and red drupes (stone-fruit) of the size of a pea. The branches are used for making crates. The shrub has been much admired for its modest beauty. Keats speaks of

> 'The drooping flowers
> Of whitest casia, fresh from summer showers.'

CASIMIR, *kăs'e-mēr*, properly Kazimierz, *kâ-ze-me-ārzh':* name of many Polish princes and kings. With the establishment of the power of Casimir I., 1040, the predominance of Christianity was decided in Poland. But the most distinguished of this name was Casimir II., called Casimir the Great, who succeeded his father, Vladislaus Loketek, as king of Poland 1333. He added Little Russia and Red Russia to his dominions; repelled the Tartars, who then threatened Poland; and waged successful war in Silesia, which he conquered but did not retain. He showed great anxiety for the advancement of the arts and of learning in his kingdom, and for the improvement of the condition of the most oppressed classes, which won him the title of king of the peasants. A Jewish mistress obtained from him liberties for the Jews, which they have since retained in Poland. He died in consequence of the falling of his horse, 1370.

CASIMIR-PERIER, Jean Paul Pierre: President of the French republic: b. Paris, 1847, Nov. 8; d. there, 1907, March 11. He served in the Franco-Prussian war, and received the decoration of the Legion of Honor for bravery. In 1876 he was elected to the Chamber of Deputies; in 1890 vice-president of the chamber, and in 1893, president. He resigned to become premier, which office he held till the assassination of President Carnot, when he was chosen his successor on the first ballot (June, 1894). He resigned the office of president, January, 1895, and was succeeded by Félix Faure.

CASINGS, n. plu.: see Cazons.

CASINO, n. *kă-sē'nō* [It. *casino*—diminutive of *casa*, a house—from L. *casa*, a cottage]: small country-house; saloon for dancing; place for social reunions. The Italian nobles have long had casinos detached from the palaces in which they live, whither they can retreat and enjoy themselves, and it is probable that the *public* casinos were the result of an imitation by the middle classes. In Italy, a casino is generally close by a theatre, and is a place where musical or dancing soirées are held, containing a conversation-room, billiard-room, and rooms for other kinds of amusement, as well as small apartments where refreshments may be had. Casinos are numerous in Italy and Germany, and have been introduced into England and the United States. In general there has been some question as to the desirableness of the influences which they exert.

CASINO, or MONTE-CASINO: mountain overhanging the town of San-Germano (anc. *Casinum*), in the Italian province of Caserta, between 50 and 60 m. n.n.w. of Naples: celebrated for the monastery founded here by St. Benedict (q.v.) in 529. This monastery is remarkable for its noble architecture, its ancient wealth, its library and archives, and in modern times for the learning of its monks, who have a printing-press, from which several important works have issued. The beautiful situation of the abbey formerly made Monte-Casino a favorite resort of pilgrims.

CASIRI, *kâ-sē′rē*, MICHAEL: Orientalist and Syro-Maronite clergyman: b. Tripoli, Syria, 1710; d. Madrid, 1791. He studied in the College of St. Peter and St. Marcellino; and in 1734 entered the clerical profession. The following year he accompanied the learned Assemanni to Syria, where he was going, at the command of the Pope, to attend the synod of the Maronites, and in 1738 gave, at Rome, an exact account of the religious tenets of the Maronites. He afterward taught in his monastery the Arabic, Syrian, and Chaldee languages, theology and philosophy; and in 1748 was appointed to an office at Madrid. In 1749 he devoted his attention, by the king's orders, to the library of the Escurial, of which he subsequently became the superintendent. Here he collected the materials for his celebrated work, *Bibliotheca Arabico-Hispana*, which enumerates in 1851 articles the manuscripts of the Escurial Library, perhaps the richest in Europe in Arabic manuscripts.

CASK, n. *kăsk* [Sp. *casco*, a vessel for holding liquids: F. *casque*, a case]: a round, close, wooden vessel for holding liquors, formed of staves and hoops.

CASKET, n. *kăsk′ĕt* [dim. of *cask:* F. *cassette*, a little box, a case for jewels—from F. *casse*, a printer's case, formerly a chest or box]: a small chest or box for holding jewels, trinkets, etc.: [U. S.] a burial-case of one width from head to foot.

CAS′LER, JOHN OVERTON: American soldier: b. Frederick county, Va., 1838, Dec. 1. He served in the Confederate army during the Civil War and was a prisoner of war from February to May 1865. He lived in Texas 1877–89, and has since been a resident of Oklahoma City, where he is justice of the peace. He is the commander of the Oklahoma division of United Confederate Veterans, and has published: *Four Years in the Stonewall Brigade* (1893); *Lillian Stuart, the Heroine of the Rappahannock* (1889); etc.

CASPIAN SEA, *kăs′pĭ-an:* inland sea, or great salt-lake, largest in the world; on the boundary between Europe and Asia, extending from lat. 36° 40′ to 47° 20′ n., and long. 46° 50′ to 55° 10′ e Its length from n. to s. is about 700 m., and its average breadth about 200 m.; total area estimated 180,000 sq. m. The coast-line is irregular, and on the e. side especially there are several bays and indentations of coast, the principal being those of Mertvoi, Mangushlak, Kenderlinsk, Karabugos, and Balkan. From the

west, the naphtha-impregnated peninsula of Apsheron stretches into the C. opposite the Balkan Gulf; Mount Caucasus also rises on its w. side. On the s. is the lofty range of the Elburz Mountains, between which, however, and the coast, on this side almost unbroken, extends a low, flat plain 15 to 20 m. in breadth. On the n. it is bordered by great steppes, and the country e. is a vast plain. It is probable that at one time its waters, which are said to be still diminishing, covered great part of the adjacent steppes. Some singular changes appear to take place in the level of the Caspian. Various measurements have made its depth and elevation different. One Russian measurement made it 348 ft. below the level of the Black Sea; another only 84 ft. The latter is confirmed by Major Wood (*The Shores of Lake Aral*, 1876). It has no tides, but its navigation is dangerous because of violent storms, especially from the s.e., by which its waters are sometimes driven for many miles over the adjacent plains. The depth near the s. end is about 600 ft. and in some places near the centre it attains a depth of nearly 3,000 ft.; but near the coast it is very shallow, seldom reaching a depth of more than three ft, at 100 yards from the shore, and in many places a depth of 12 ft. is not reached within several miles of the beach. On the n.e. and e. especially it is shallow. It receives the waters of a number of large rivers, of which the greatest is the Volga. The Ural, the Terek, the Kur, and the Atrek also fall into it. The water of the C. S. is salt, but much less so than that of the ocean. Its n. parts are covered with ice during winter. It abounds in fish, and very valuable fisheries are carried on, especially for sturgeon and salmon. By a canal uniting the head-waters of the Volga with the rivers Tvertza and Schlina, the C. is united with the Baltic Sea. The sea is now surrounded on three sides by Russian territory, the s. shore still remaining Persian. The Russians have a fleet upon it, and lines of steam packets. The chief Russian towns upon its shores are Astrakhan, Derbend, Baku, and Krasnovodsk (q. v.), from near which a railway runs by Askabad toward Merv. Balfrush, Reshd, and Astrabad are Persian towns. The practicability of making the Amu-Daria (see OXUS), now running into the Sea of Aral, again an affluent of the C. S., has recently been much debated.

The C. S. was known to the Greeks and Romans, According to Strabo, it derived its name from the Caspii, a tribe inhabiting its western shores. The name Caspian was afterward limited to the w. portion of the lake—the e. being designated by the Hyrcanian Sea.

CASQUE, n. or CASK, n. *kăsk* [F. *casque*, a helmet—from Sp. *casco*, a helmet, a cask]: a helmet or head-piece for a soldier: see HELMET.

CASS, LEWIS: 1782–1866, June; b. Exeter, N. H.: statesman. He was educated for the law, but quitting that profession, he entered the army, 1812, and rose rapidly to the rank of general, though his merit was not very conspicuous. In 1813, he was elected gov. of Michigan, in

L. W. CASS.

which state he had settled. During his governorship, he kept himself apart from party politics, yet all his measures had a decidedly democratic tendency. In 1831, C. was made minister of war under General Jackson, and in 1836 he was sent as plenipotentiary to Paris. In this capacity he made himself popular by his replies in *Galignani's Messenger* to the attacks of the English press on the claims of the union with regard to its n.e. boundaries, and by his protest against the measures of Guizot; but the treaty concluded by Daniel Webster with Lord Ashburton was so much opposed to the views maintained by C., that he resigned his post, and in 1843 returned to America, where he was received with popular favor. He now aimed at the presidency, and in 1844 was put in nomination, but was defeated, as also in 1848, when he was again nominated. In 1857 he was appointed sec. of state, resigning office in 1860. Though active and energetic he had no claim to comprehensive statesmanship. In regard to slavery his conduct was ludicrously inconsistent, and seems to have been determined by a view to what would be popular with those whose favor he was seeking at the moment. Latterly he went wholly with the slave holding party, advocating an extension of territory with a view to extend the ramifications of slavery. He was noticeable for his bitter hostility to Britain, against which he was ever ready to inflame the minds of his countrymen. He is the author of the *History, Tradition, Languages, etc., of Indians in the United States;* of *France: its King, Court, and Government;* and other works.

CASSABA, *kâs-sâ'bâ*, or CASABA, *kâ-sâ'bâ:* town of Asia Minor, 63 m. e. of Smyrna, and connected with it by railway. It is supplied with water by an ancient aqueduct two or three m., away, and the ruins of Sardis are within 21 m. The surrounding country raises and exports melons, silkworms, and cotton; the town has four ginning factories. C. suffered from fire and cholera 1865. The Greek language is largely used. Pop. abt. 15,000, two-thirds Turks.

CASSAGNAC: see GRANIER DE CASSAGNAC.

CASSAN'DER, King of Macedonia: B.C. 354–297 or 296; son of Antipater. When young he is said to have been ill used by Alexander the Great, and to have consequently conceived a mortal hatred to that monarch's family. On the death of his father, he expected to succeed to the regency; but Polysperchon received the honor instead, which so dissatisfied him that he resolved to contest the sovereignty with his opponent. He was completely successful; but while pursuing his career of conquest in the s. of Greece, he learned that Olympias, mother of Alexander, was committing havoc in the n., and consequently hurried back to Macedonia. In less than a year Olympias was taken prisoner and put to death. Only Roxana, wife of Alexander, and her son Ægus, now stood between him and the throne of Macedon; but he did not find it convenient to 'make away' with these two until several years had passed. Meanwhile, he married Thessalonica, half-sister to Alexander, in whose honor he founded, about B.C. 316, the town which

bears her name. In the following year he caused Thebes, which Alexander had destroyed, to be rebuilt. He next became involved in a war with Antigonus, King of Asia, which, with an intervening peace of one year, lasted from B.C. 315–301, in the last of which years Antigonus was defeated and slain at the battle of Ipsus. With his auxiliaries Seleucus, Ptolemy, and Lysimachus, he seized and shared the dominions of the vanquished. The rest of C.'s life was spent in intrigue and military enterprise.

CASSANDRA, *kâs-sân'drâ:* peninsula in the province of Roumelia, European Turkey; between the Gulfs Salonica and Cassandra; lat. 40° n., long. 23° 30′ e. The ancient name of this headland was *Pallene.* Grain of superior quality is raised here; wool, honey, and wax are produced; and silk-worms are extensively reared.

The gulf of Cassandra (anc. *Toronaicus Sinus*) has a length of 33 m from s.e. to n.w., and a breadth of 10 m.

CASSANDRA, n. *kăs-săn'dră* [the daughter of Priam who had the gift of prophecy, but, through the influence of Apollo, no one believed her predictions]: one whose predictions no one believes.

CASSAN'DRA: according to Homeric legend, the fairest daughter of Priam and Hecuba, and twin-sister of Helenus. The children playing in the court of the temple of the Thymbræan Apollo, not far from Ilium, till it was too late for them to return home, a bed of laurel-twigs was made for them in the temple; and there, in the morning, two snakes were found licking their ears, from which resulted such an acuteness of hearing, that they could hear the voice of the gods. C. afterward attracted the love of Apollo by her beauty, and he taught her the secrets of prophecy; but displeased by her rejection of his suit, laid upon her the curse that her vaticinations should never be believed. Accordingly she prophesied in vain of the treachery of the Grecian horse and the destruction of Troy. On the capture of the city she fled to the temple of Minerva, but was torn from the altar by the Locrian Ajax, and ravished in the temple. She afterward, in the distribution of the captives, fell to the share of Agamemnon, to whom she bore twin sons, but was murdered by Clytemnestra.

CASSANO, *kâs-sâ'nō:* town of Italy, province of Cosenza, 34 m. n. of the town of that name. It is in a valley in the midst of beautiful scenery, has a cathedral, an old castle built on an imposing mass of rock in the midst of the city, and manufactures of linen, leather, silk, cotton, and macaroni. Pop. 8,000.

CASSANO: town of n. Italy, 17 m. e.n.e. of Milan. It is situated on the right bank of the Adda, here crossed by a bridge on the railway to Brescia, and has extensive silk-mills. C. was the scene of two sanguinary battles—one in 1705 between the French under the Duke de Vendôme, and the imperialists under Prince Eugene, in which the latter were defeated; the other in 1799, when the Russians and Austrians under Suwarow defeated the French under Moreau. Pop. 4,500.

CASSATION, n. *kăs-sā'shŭn* [F. *cassation*—from *casser*, to break down, to make void: comp. Lat. *quatere*, Eng. *quash*]: the act of repealing or annulling. COURT OF CASSATION, the highest court of appeal of France. But as everything is excluded beyond the question whether or not the view taken of the law, and of the proper method of administering it by the inferior tribunal, has been the right one, the idea attached to this institution is less that of a court in the ordinary sense than of a dept. of government to which the duty of inspecting the administration of justice is assigned. By the 65th article of the constitution of the year VIII., it was enacted that there shall be 'for the whole of France a tribunal of cassation, which shall pronounce on demands for cassation against judgments in the last resort pronounced by the tribunals;' and the following article of the same constitution bears that this supreme tribunal shall pronounce no judgment on the foundation or merits of the cause, but that, in case of its breaking the judgment pronounced, it shall remit to the tribunal appealed from to pronounce another. The title of tribunal was afterward changed for that of court, by a *senatus consultum* of the year XII.; but substantially the institution has retained its original character, notwithstanding the changes of government. The demand for cassation can be made only by the parties to the suit, or by the *procureur-général* of the court of C. for the public interest. Criminal as well as civil judgment may be reviewed by the court of C., the only exceptions being the judgments of justices of the peace and of courts-martial, military and naval. The delay allowed for bringing a civil case before the court of C. is three months for persons domiciled in France, six months for those in Corsica, a year for American colonists, and two for all persons resident beyond the Cape of Good Hope. In criminal matters the procedure is greatly more prompt, three full days only being allowed to the person condemned to bring his action of C., and the same space being given to the procureur-général. In all criminal and police cases the court of C. may pronounce judgment immediately after the expiry of these days, and must do so within a month. The court of C. is divided into three sections, one of which is devoted to criminal matters. Its staff consists of a president, who has the title of *first* president, and three vice-presidents, who are called presidents; 45 counselors or ordinary judges; a procureur-général, or public prosecutor; six substitutes, who have the title of advocates-general; and several inferior officers. The presidents and counselors are named by the sovereign for life, the other officers being removable at pleasure. No judgment can be pronounced unless 11 judges are present, the decision being determined by the majority. Where the numbers are equally divided, five judges are called in; and cases of peculiar difficulty may be judged of by the three sections united. The whole court, when presided over by the minister of justice, possesses also the right of discipline and censure over all judges for grave offenses, not specially provided for by the law. When thus constituted, the court of C. may suspend the judges of the

imperial courts from the exercise of their functions, and call them to its bar. The procureur-général of the court of C. likewise possesses a surveillance over the procureurs-généraux of the imperial courts.

The members of this august tribunal wear a red gown with a violet *toque*, or cap of velvet; the robes of the presidents and of the procureur-général being doubled with white fur.

CASSAVA, *kăs'sa-vâ*, or CASAVA (q.v.): West Indian name of the plant called MANIOC (q.v.), and of the starch produced from it, which is otherwise called Brazilian arrow-root, and is popularly known as TAPIOCA (q.v.).

CASSAY, *kăs-sā'*, or MANIPUR, *mŭn-e-pór':* native state in n.e. India, between Assam and independent Burmah. It is dependent on Britain, has a British political agent, but pays no tribute. Area, 8,000 sq. m. The people are partly Manipuris (of Mongolian extraction), and partly wild hill tribes, Lushais, Kukis, Nagas, etc. The people of the fertile valley of Manipur are chiefly Hindus, with some Moslems; the wild tribes of the hill country, pagans. There is little trade, roads being useless for carts. Imports are betel-nut, cloths, hookahs, spices, and tools: exports are ponies, cloth, silk, beeswax, tea-seed, ivory, and india-rubber. Before the Burmese war of 1825, C. was occupied by the British; and, being permanently ceded at the close of the contest, it was handed over to the native rajah. The chief town is Manipur, also spelled Munnipore. Pop. of C. 140,000.

CASSEL, *kâs'sel:* capital of the former electorate of Hesse-Cassel, now a portion of Prussia, pleasantly situated on both sides of the Fulda, here a navigable river, 120 m. by rail, n.n.e. of Frankfurt-on-the-Main. The oldest part of the town consists of a few very narrow, crooked streets, close on the banks of the Fulda; the more modern parts are on hills, which rise gently from the river. C. is partially walled. In Friedrichs-Platz, the largest square in any German town, stands the elector's palace, a comparatively mean structure: a little below is the first story of a magnificent palace commenced in 1820, and stopped in the following year by the death of the elector who projected it. Among public buildings and institutions, one of the most important is the *Museum Fredericianum*, which has a library of 90,000 vols. and some valuable MSS. The picture-gallery contains about 1,400 paintings, including excellent specimens of the best masters. In the cabinet of curiosities are examples showing the gradual development and improvement of watchmaking from the earliest ininvention at Nuremberg to the present time. C. contains an observatory, and is the seat of a number of learned and scientific associations. From 1807–13 it was cap. of the kingdom of Westphalia. The gardens of Wilhelmshöhe—which was assigned by William I. of Germany to the late Emperor Napoleon as a residence after his fall at Sedan, 1870, Sep.—with their splendid fountains and cascades, and the colossal statue of Hercules, within the hol-

low of whose club eight persons can stand at one time, are only three miles from Cassel. There are manufactures of cotton, woolen, and silk fabrics, lace, and carpets. Under the name of *Chassala*, the town appears to have existed as early as the 10th c. Pop. (1885), including military with servants and laborers, 64,083; (1900) 106,034.

CASSEL, *kâs-sĕl':* town of France, dept. of the Nord, 27 m. n.w. of Lille; known to the Romans, who had a station here, as *Castellum*. It is pleasantly situated on a hill, overlooking a country on all sides so flat, that the view, although the elevation is only 800 ft., is said to be one of the widest in Europe, extending over the broad fertile plains of Flanders, and to the chalk cliffs of England, and taking in 32 towns and 100 villages. During the great trigonometrical survey undertaken in the reign of the first Napoleon, Mont Cassel was one of the chief signal stations. C. has manufactures of lace, linen, thread, hosiery, etc. Pop. about 3,200.

CASSIA, n. *kăsh'ĭ-ă* [L. and Gr.]: 1. name given by the ancients to a kind of medicinal bark, but their descriptions are so imperfect that it is impossible to determine what bark it is. In the English translation of Ex. xxx. 24, and Psa. xlv. 8, the name is from the Septuagint; and probably the substance intended is the same now known as *Cassia bark*, or *Cassia lignea*.

2. *Cassia* is now the botanical name of a genus of plants of the nat. ord. *Leguminosæ*, sub-order *Cæsalpineæ*, containing many species—more than 200 having been described—trees, shrubs, and herbaceous plants, natives of Africa and of the warm parts of Asia and America. They have abruptly pinnate leaves, and flowers with deciduous calyx of five somewhat unequal sepals, corolla of five petals, of which the lower ones are the larger, ten free stamens, of which three are long, four short, and three abortive, and anthers opening by two holes at the top. The leaves and pods of many species have a peculiar sweetish but nauseous smell, and a nauseous, bitter taste accompanied with a loathsome sliminess. They seem all to contain the purgative principle called cathartine (q.v.), and the leaves of some of the Asiatic and African species are highly valued, and much used as a medicine, under the name of Senna (q.v.). The leaves of *C. Marylandica* possess similar properties, and are now used to some extent in the United States. *C. Fistula* (*Cathartocarpus*) yields the C. of the pharmacopœias, the *C. pods, Pipe C.* or *Purging C.* of the shops. It is a large tree, native of Egypt and other parts of Africa; perhaps also of the East Indies, in which it is now widely diffused and cultivated, as well as in the West Indies and warm parts of America. Its leaves have four to six pair of ovate smooth leaflets; its flowers are yellow and in loose racemes; its pods, which have obtained for it the name of *Pudding-pipe Tree*, are sometimes two ft. in length, cylindrical, black, consisting of thin, brittle, woody valves, within which is a cavity divided by numerous thin transverse partitions, each cell containing a single

seed imbedded in a soft black pulp. It is this pulp that is the part used in medicine; it has a sweetish, mucilaginous taste, and in small doses is a mild laxative. It is sometimes removed from the pods when fresh; or an extract is obtained after they are dried by boiling and evaporating. It is said to contain 61–69 per cent. of sugar. The C. pods of the West Indies contain much more pulp, and are therefore more valuable than those imported from the East.

3. *C. Bark*, or *C. lignea*, sometimes called *China Cinnamon*, is a bark very similar to cinnamon both in appearance and properties, but in thicker pieces, and less closely quilled, of a less sweet and delicate flavor, but more pungent. It is the produce of the *Cinnamomum Cassia* or *aromaticum*, a tree of the same genus with the Cinnamon-tree, native of China, extensively cultivated there. It is highly esteemed by the Chinese, and is now largely imported into Europe. As it contains a greater proportion of essential oil, and is also much cheaper than true cinnamon, it is much more generally used. The oil which it contains is called *Oil of Cassia*, and is very similar to oil of Cinnamon. Coarse cinnamon is sometimes sold as cassia. *C. Buds* are believed to be the dried flower-buds of the same tree which yields C. bark. In flavor and other qualities, they resemble C. bark; in appearance, they are very similar to cloves. They are used in confectionery.

CASSIANUS, *kas sĭ-ā'nus*, JOANNES, or JOANNES MASSILIENSIS, or JOANNES EREMITA: Christian teacher in the early part of the 5th c.; died after 433: distinguished promoter of monachism in southern Gaul, and opponent of the extreme dogmas of St. Augustine respecting grace and free-will. Shortly before 415 he went to Massilia (Marseille), where he founded two monasteries according to the rules laid down in his *De Institutis Cœnobiorum*. One of these monasteries was for nuns; the other was the famous Abbey of St. Victor, which under C. is said to have had not less than 5,000 inmates, and which served as a model to a multitude of monastic institutions in Gaul and Spain. His *Collationes Patrum Sceticorum* is a work in 24 chapters, each of which gives a 'spiritual colloquy between monks in the desert of Sketis,' regarding the monastic life, and the vexed questions of theology. C.'s Grecian erudition, his dislike of dogmatic subtilties, and his zeal for monastic habits, led him to oppose the doctrines of St. Augustine on works and grace, and to set up a doctrine which was known by the schoolmen as 'semi-pelagianism': see PELAGIANISM. As C.'s doctrine gained support from the Massilian monks, St. Augustine, having been informed of it by his friend Prosper of Aquitaine, wrote strongly against it, especially in his treatise *De Gratia et Libero Arbitrio, contra Collatorem*. It is not known when C. died. The first collected edition of the various works attributed to him was published at Basel, 1559; the best at Frankfurt, 1722. The best account of his life and writings is by Wiggers, *De Johanni C.* (Rostock, 1824-5)

CASSICAN, *kâs'si-kan* (*Cassicus*): genus of birds allied

to starlings, having an exactly conical bill, thick at the base, and extremely sharp pointed, the commissure forming an angulated line, the bill ascending on the forehead, and encroaching circularly on the plumage. They all are American birds of gregarious habits, feeding both on fruits and on insects, and 'exhibiting such surprising skill and ingenuity in the structure of their nests that an old lady once gravely asked an American ornithologist whether he did not think they might be taught to darn stockings!' The Crested cassican, or Crested oriole (*C. cristatus*), is a native of Brazil, Guiana, and Paraguay. It is about 20 inches long, is sometimes seen in flocks of 50 or 100, and constructs its nests by knitting together shreds of a thin bark, *Tillandsias*, etc. The nest is about 36 inches long, and resembles a purse or pouch, the lower end hemispherical, and ten inches wide, and is suspended from the extremity of a branch of a tall smooth-stemmed tree on the outskirt of a forest, apparently to insure safety from monkeys and serpents. Several of these nests are often attached to the branches of the same tree.

CASSIDARIA, *kăs-si-dā′ri-a:* genus of mollusks—class *Gasteropoda* (q.v.), ord. *Pectinibranchiata*—with univalve shells, generally regarded as belonging to the family *Buccinidæ* or Whelks (q.v.), but as forming a connecting link with the family *Muricidæ* (see MUREX). The shell is ventricose, with a moderately elevated spire, the aperture elongated, and the canal recurved, but not very abruptly—much less so than in the nearly allied genus *Cassis* (see HELMET SHELL)—the columellar lip covered with a plate, and the outer lip similarly margined within. The recent species, which are not numerous, belong to tropical and subtropical seas. Fifty fossil species have been described. The genus appears first in the Upper Cretaceous measures, where a single species occurs. In the Eocene 11 have been found, and about 40 in the Pliocene. It has its fullest development as a recent shell, no less than 70 species being known.

The name *Cassidariæ* is sometimes given to a family of coleopterous insects, of which the type is the genus *Cassida:* see TORTOISE BEETLE.

CASSIDEOUS, a. *kă-sĭd′ĭŭs* [L. *cassĭdem*, a helmet]: in *bot.*, having one large helmet-shaped petal or sepal, as the aconite.

CASSIDONY, n. *kăs′sĭ-do-nĭ* [F. *cassidoine;* L.L. *cacedonius*—from *Chalcedon*, a town in Bithynia]: a species of *Lavendula stœchas*, or French lavender: a species of *Gnaphalium*, cottonweed, cudweed, or goldylocks.

CASSIN, *kăs′ĭn*, JOHN: 1813, Sep. 6—1869, Jan. 10; b. near Chester, Penn., of a Quaker family: ornithologist: his uncle and great uncle were commodores in the U. S. navy. He removed to Philadelphia 1834, became an active member of the Acad. of Nat. Science, and after 1844 contributed largely to its *Proceedings* and *Journal*. He supplied the ornithology of the *Iconographic Encyc*, 1851; of the United

States exploring expedition, 1855; of those to Chili and Japan, and of the Pacific railroad explorations and surveys. His *Illustrations of the Birds of California and Texas* appeared 1855. His *Amer. Ornithology* (1856) had 50 colored plates of species not described by Audubon.

CASSINI, *kâs-sē′nē*, Giovanni Domenico: 1625, June 8—1712, Sep. 14; b. Perinaldo, near Nice: astronomer. He studied at the College of Jesuits, Genoa. In 1650 he was appointed to the astronomical chair in the Univ. of Bologna. His first work related to the comet of 1652. He subsequently applied himself to the determination of astronomical refraction, and of the sun's parallax, etc. In 1664—5 he determined the period of Jupiter's rotation. Afterward, he determined the periods of the planets Mars and Venus, as also of the *apparent* rotation of the sun. He it was who discovered the third and fifth satellites of Saturn, and afterward the first and second, as well as the dual character of that planet's ring. He was also the first who carefully observed the zodiacal light; he demonstrated that the axis of the moon was not (as had been believed) at a right angle to the ecliptic, and explained the cause of the phenomena known under the name of lunar libration. One of his finest observations was the coincidence of the nodes of the moon's equator and orbit. Cassini died at Paris, whither he had gone in 1669, at the invitation of Colbert to take charge of the observatory erected by that minister.

CASSINI, Jacques: astronomer: 1677, Feb. 18—1756, Apr. 16; b. Paris; son of Giovanni Domenico Cassini. In 1694 he was elected a member of the Acad. of Sciences. He travelled in Italy, Holland, and England, where he formed the acquaintance of Newton, Halley, Flamsteed, etc., and was elected a member of the Royal Soc. of London. On the death of his father, he succeeded to the charge of the observatory at Paris. Cassini wrote several treatises on electricity, the barometer, etc In his treatise, *De la Grandeur et de la Figure de la Terre* (Par. 1720), he attempted to show that the earth must be a spheroid elongated at the poles. The Newtonians denied this as opposed to the ascertained facts of gravitation and rotation, which necessitated the earth's being a spheroid flattened at the poles. As an observer, Cassini was eminently successful. He determined the periods of rotation of all the satellites of Saturn then known, the inclination of the planetary orbits, the obliquity of the ecliptic very nearly, and the length of the year, etc.

His son, Cæsar Cassini, also was engaged in scientific pursuits.

CASSINI, Jean Dominique, Comte de: geographer and astronomer: 1748, June 30—1845, Oct. 18; b. Paris; son of Cæsar Cassini. He succeeded to the charge of the observatory and completed in 1789 the great topographical map of France, begun by his father. But it having been decreed in 1793 that the observatory should no longer be in the hands of one person, three others were elected to the super-

intendence of it with Cassini, whose conduct on learning this fact might suggest that he had a greater regard for his own dignity than for the whole stellar universe. He refusd to have anything more to do with astronomical science, and obstinately kept his purpose.

CASSINO, *kăs-sē′nō:* a game which probably originated in Italy or Gemany, and took its name from the casinos of club-houses. Four cards are placcd on the table, and four dealt to each player, of whom there are usually four. The greatest number of cards counts three to the holder; of spades one; the ten of diamonds two, or great Cassino; the deuce of spades one, or little Cassino, and each of the aces one; the whole game is 21. The object is to take as many cards as possible by making combinations; a ten in the player's hand will take ten from the table, or any number of cards that can be combined into ten. Another element of the game is 'building,' i. e., adding the numbers of different cards is one's hand to make up a number required. It is sometimes carried to 'progressive building,' which, however, is generally considered irregular. There is a variation of the game, making it more intricate and greatly enlarging the number of combinations in which the knave counts 11, the queen 12, the king 13, and the ace one or 14, as may be determined by the players.

CASSIOBERRY, n. *kăs′sĭ-o-bĕr-rĭ* [mod. L. *cassine*—from the native name; Eng. *berry*]: the fruit of the *Viburnum lævigatum.*

CASSIDORUS, *kăs-sĭ-ō-dō′rŭs,* or (according to several MSS.) Cassiodo′rius. *-rĭ-us,* Magnus Aurelius: abt. 468—abt. 568; b. Scylaccum (now Squillace), in Calabria: Latin writer, distinguished by his erudition in an age of barbarism. He was of a noble Roman family, and soon attracted the attention of Odoacer by his superior abilities and accomplishments. Under this monarch he held various offices, but after the defeat and murdcr of Odoacer by Theodoric the Ostrogoth, he passed into the service of the latter. The highest honors now fell upon him; and for years he administered the Ostrogothic power with remarkable prudence. and success. In his 70th year, however, he withdrew to Calabria, where he founded the monastery of Viviers, and employed himself and the other monks in the invaluable work of copying classical MSS; his great desire being to improve the education of the clergy. Besides his grammatical and rhetorical manuals, which were used as textbooks during the middle ages, he wrote a very important work, entitled *Variarum Epistolarum Libri XII.*

CASSIOPEIA, n. *kăs′ĭ-ŏ-pē′yă* [after the mythical wife of Cepheus]: the *Lady in her Chair;* constellation in the n. hemisphere, near Cepheus, and not far from the north pole, on the side opposite that of the Great Bear. It is marked by five stars of the third magnitude, forming a figure like an M. A line from Capella to thc bright star in Cygnus passes nearly through the middle of this M. Cassiopeia according to Flamsteed, contains 55 stars, all of small mag-

nitude. The figure is that of a woman sitting in a chair with a branch in her hand. In the year 1572, there suddenly appeared in C. a new star, noticed first by Tycho Brahé, Nov. 11, when its lustre exceeded that of all the fixed stars, and nearly equalled that of Venus. The star gradually diminished in lustre, from the time of its being observed until it disappeared, 1574, March. It is said to have alarmed all the astronomers of the age. Tycho Brahé wrote a treatise on it, and supposed—without good reasons—that it had previously appeared in 945 and 1264. Sir John Herschel suggested the possibility of its reappearance in 1872, but his suggestion was not verified.

CASSIQUIARE, *kâs-sē-kē-â'râ*, or CASSIQUIARI, *kâs-sē-kē-â'rē*: river of Venezuela, S. America, the s. bifurcation of the Orinoco, which it leaves in lat 3° 10′ n., long 66° 20′ w., and after a rapid s.w. course of about 130 m., joins the Rio Negro in lat. 2° 5′ n., long 67° 40′ w. About 100 yards in breadth when it issues from the Orinoco, it gradually increases until at its union with the Rio Negro it attains a width of 600 yards. By means of this singular river, water communication is established, through the Amazon, Orinoco, and their affluents, between the interior of Brazil and the Caraccas in Venezuela.

CASSIS, *kă-sē'* [F., the black currant-tree]: French liqueur prepared from black currants; the manufacture has recently become of great importance: see CURRANT.

CASSIS: see HELMET-SHELL.

CASSITERIDES: see SCILLY ISLES.

CASSITERITE, n. *kăs'sĭt'ĕr-īt* [Gr. *kassit'ĕros*, tin]: the oxide of tin, being the ordinary tin ore; tin-stone: see TIN.

CASSIUS, *kash'e-us*, LONGI'NUS CAIUS: one of Cæsar's assassins: d. B.C. 42. At the breaking out of the civil war, though a tribune of the plebs, he sided with Pompey and the aristocratic faction against Cæsar. He was taken prisoner by the latter, who pardoned him, and even made him one of his legates. In B.C. 44, through the influence of Cæsar, he was made *prætor peregrinus*, and was promised the governorship of Syria in the following year. But his mean and jealous spirit could not endure the burden of gratitude imposed upon him by the generosity of the dictator, and he resolved to be released by the murder of his benefactor. Having attached to himself the mutinous spirits among the subjugated aristocracy, and also won over M. Brutus, the pseudo-patriotic conspiracy was soon matured, and, B.C. 44, Mar. 15, Cæsar fell by the daggers of assassins. The result of this bloody deed was not what C. had expected. The popular feeling—as witnessed by the riots that broke out at Cæsar's funeral—was strongly against the murderers; and the military power fell into the hands of Mark Antony. C. therefore fled to the east, and made himself master of Syria. Afterward he united his forces with those of Brutus, and, having greedily plundered Asia Minor. They crossed the Hellespont in the beginning of B.C. 42, marched through Thrace, and took up a superior

position near Philippi, in Macedonia. Here they were attacked by Antony and Octavian. The division commanded by C. was totally routed, though, on the other hand, Brutus succeeded in repulsing the troops of Octavian. C., supposing that all was lost, compelled his freedman, Pindarus, to put him to death. C.'s wife, half-sister of Brutus, survived him upward of 60 years. She died in the reign of Tiberius, A.D. 22.

CASSIUS, PURPLE OF: coloring substance of very ancient use, prepared by adding a mixed solution of protochloride and bichloride of tin gradually to a solution of chloride of gold, when a more or less abundant precipitate of the double stannate of gold and tin (AuO,SnO_2+SnO,SnO_2) is thrown down. The purple of C. is soluble in ammonia, yielding a very pretty purple solution, from which it can again be obtained, with solid form unchanged, by evaporating the ammonia. Mixed with borax, or some fusible glass, purple of C. is employed by the potter to communicate a rich purple or rose tint to the better kinds of china, and it also imparts the red color of the kind of glass known as *Bohemian glass.*

CASSIVELAUNUS, *kas-si-ve-law'nŭs:* British chief, who fought against Cæsar during his second invasion of the island, B.C. 54. He ruled the country n. of the Thames, and had great reputation as a warrior, but his capital was taken by the Romans, and he himself compelled to flee. He afterward sued for peace, which he obtained, on condition of paying tribute and giving hostages.

CASSOCK, n. *kăs'sŏk* [F. *casaque*—from It. *casacca,* a man's long gown: Gael. *casag,* a long coat]: long loose coat, formerly in common wear, but now usually worn only by clergymen under the surplice or pulpit-gown. As worn by the clergy of the Church of England, it is a long coat with a single upright collar. Black is the common color for all orders of the clergy, but on state occasions bishops frequently wear purple cassocks. In the Rom. Cath. Church, cassocks vary in color according to the dignity of the wearer—priests wearing black, bishops purple, cardinals scarlet, and the pope white. CAS'SOCKED, a. *-sŏkt,* clothed with a cassock.

CASSOWARY, n. *kăs'sō-wā'rĭ* [the Malay name *kassuwaris*], (*Casuarius*): genus of birds nearly allied to the ostrich (see BREVIPENNES and OSTRICH), but distinctively characterized by still shorter wings, by a laterally compressed bill, by a bony crest, by pendent wattles on the naked neck, and by three toes on each foot, all furnished with claws, the inner toe short, and armed with a very long and sharp claw. There are also very important anatomical differences in its digestive organs, which are not adapted to the same coarse diet, for the C. 'has short intestines and small coeca, lacks the intermediate stomach between the crop and gizzard, and its cloaca does not proportionally exceed that of other birds.' There are about ten species of C., the best known of which is *Casuarius galeatus,* native of New Guinea, the Moluccas, and other Asiatic islands. Most of the other species are in-

genous to New Guinea; the *C. Australis* is a well-distinguished Australian form. In general appearance, the cassowary is like the ostrich, but has a much shorter neck. It is the largest known bird, except the ostrich, and its height, when erect, is about five ft. It feeds on fruits, eggs, and succulent herbage. When attacked it defends itself by kicking obliquely backward with its feet, and by striking with its short wings, the rigid barbless shafts of which, though useless even to aid it in running, are not without value as

Cassowary.

weapons. There are only about five of them in each wing, somewhat resembling the quills of a porcupine; and at the end of the last joint of the wing there is a spur. The color of the C. is brownish black; the feathers are loosely webbed, and hang down, so that, at a little distance, the bird seems clothed with hair. Those of the rump are 14 inches long, hanging down in place of a tail. The head and upper part of the neck are naked and of a bluish color, and there are two pendent wattles, partly red and partly blue, on the front of the neck. On the breast is a callous bare part, on which the bird rests its body on the ground. The bony crest or helmet reaches from the base of the bill to the middle of the crown, and is about three inches high, exhibiting the most intense blue, purple, and scarlet blended together. The C. lays a few eggs, which it leaves to be hatched by the heat of the sun; and which are greenish, and have a much thinner shell than those of the ostrich. Its flesh is black, tough, and juiceless. The C. is frequently seen in menageries in Europe and America, but is becoming more rare in its native regions, in which it is sometimes kept tame.

CAST, v. *kăst* [Icel. *kasta;* Dan. *kaste*, to cast: Sp. *cascar*, to crack, to burst: F. *casser*, to break—from L. *quassārĕ*, to break: It. *cascare*, to fall]: to crack and throw out, as some seed-vessels their seeds when ripe; to throw or

fling; to put or place; to sow seed; to reject; to compute or reckon; to contrive or plan; to mold or shape; to ponder or weigh, as in the mind: N. a throw: the distance passed by a thing thrown; a glance or a turn of the eye; chance or hazard; a form or shape; a tinge; manner; whatever is run into a mold; a gut-line to which hooks are attached in angling. CAST'ING, imp. ADJ. deciding, as a vote: N. a molding; the act of running into a mold, as molten metal (see FOUNDING). CAST, pt. and pp. TO CAST ABOUT, to contrive; to consider carefully. TO CAST ANCHOR, to let it drop into the water. TO CAST ASIDE, to dismiss or reject. TO CAST AWAY, to reject; to lavish. TO CAST BY, in *OE.*, to reject or dismiss; to throw aside. TO CAST DOWN, to deject or depress. TO CAST FORTH, to throw out; to exhale. TO CAST OFF, to discard, or to put away. TO CAST OUT, to reject; to throw or turn out; in *Scot.*, to fall out; to quarrel. TO CAST PEATS, to dig them in proper shape. TO CAST UP, to compute; to reckon; to eject or vomit; in *Scot.*, to appear unexpectedly; to throw in one's teeth; to reproach. TO CAST ON, to put or place on, as loops of worsted on wires. TO CAST ONE'S SELF ON, to resign or yield to the disposal of, without reserve. TO CAST IN THE TEETH, to upbraid; to blame for. TO CAST IN ONE'S LOT WITH ANY ONE, to take the chance; to share the fortune. THE CAST OF A PLAY, the company of actors to whom the parts are assigned. LAST-CAST, all ventured on one effort. CAST-IRON, iron melted from the ore, and run into molds—called also PIG-IRON or CAST-METAL: CAST-STEEL: see STEEL. CASTING-VOTE, a vote that decides, when the votes are equally divided.

CAST, *kâst:* impression produced by pouring a ductile substance, such as plaster of Paris, into a mold. This method was employed by the ancients in multiplying not only objects of art, such as the small household statues of the gods but articles of direct utility. The so-called *Celts*, or chisels of bronze, which, with the molds for casting them, are found in England, Ireland, and France, testify to the fact that the art of casting from a mold is one of the earliest acquired by semi-civilized nations. Casts of sculptures are of great value in familiarizing the eyes of those who can never look on the originals with the grand and beautiful forms of antique art. None are superior to those executed, and sold on application, at the British Museum. Casting, applied to metals, is called founding (q.v.)

CASTAGNO, *kâs-tân'yo,* ANDREA DEL: 1390–1457, Aug.; b. Castagno, in dist. of Mugello, Tuscany; painter. He is said to have been tending cattle in the fields when he attracted the attention and patronage of Bernardetto de Medici, who had him educated at Florence; here he imitated Masaccio and the naturalists. He was commissioned, 1435, to paint in the Podesta's palace the fallen leaders of the Peruzzi and Albizzi, and thence was called Andrea degl' Impiccati, 'of the hanged ones.' Most of his works have perished, but his equestrian figure of Nicola di Tolentino, in the cathedral of Florence, remains. C.'s fame suffered

for four centuries under the charge of murdering, to secure a professional secret, Domenico Veneziano, who really survived C. four years.

CASTAIGNE, André, *ân'-drā kâs-tān*: French artist: b. Angoulême 1861. He studied at the Suisse Academy and at the École des Beaux Arts in Paris; he exhibited at the Paris Salon in 1884 and several times in later years. Among his pictures are *Dante and Beatrice; The Deluge; Portrait of Vicomte de Dampierre;* and *After the Combat* (in the Peabody Gallery at Baltimore). In 1890 he came to the United States and remained here until 1895. He was director of an art school in Baltimore and in 1891 began the illustrating work by which he is best known to the American public. His first work of this character was *The Forty Niners' Ball* in the *Century Magazine* for 1891, May; since then he has illustrated for several of the leading magazines; his designs include the pictures of the Texas cowboys in *Scribner's Magazine* and the World's Fair drawings and illustrations for *Polly* in the *Century*. On his return to France be became instructor in the Colarossi Academy and opened a studio in Paris. See *The Critic* Vol. XXIII., 57; *The Bookbuyer* XII., 506.

CASTALDI, *kâs-tâl'dē*, Pamfilis: 1398–1470: in Italy, deemed the inventor of movable types, and in 1868 was honored by the erection of a monument at Feltre. In early life he applied himself to poetry with little success, and afterward established a school of fine arts at Feltre, which attracted many foreigners. It is claimed that in this way Castaldi came into connection with Faust, and, as his friend, imparted to him the use of his invention.

CASTALIA, *kăs-tā'lĭ-a:* fountain on the slope of Parnassus a little above Delphi, in Phocis, sacred to Apollo and the muses. It was the 'holy water' of theDelphian temple; and all who came to consult the oracle, or visited the place with any religious purpose whatever, were wont to bathe their hair *rore puro Castaliæ* (in the pure dew of C.), but those who wished to be purified from murder bathed their whole body. The Roman poets feigned that its waters filled the mind of those who drank of it with poetic inspiration. It was imagined to have some connection with the river Cephisus, and to flow from the subterranean Styx. The fountain, whose waters are still pure and delightful as in the days of classical antiquity, now bears the name of St. John, from a small chapel of that name close by. Castalian, a. *kăs-tā'lĭ-ăn* [L. *Castalĭŭs*]: pertaining to Castalia.

CASTALIDES, *kăs-tăl'ĭ-dēz*, the Muses, so called from the fountain Castalia, at the foot of Parnassus.

CASTALIO: see Castellio.

CASTANEA: a trade name for the Brazil-nut and the genuine name for the chestnut (qq.v.).

CASTANETS, n. plu. *kăs'tă-nĕts'* [Sp. *castanyeta*, castanets—from *castanya*, a chestnut]: musical instrument of

percussion in the form of two small hollow concave shells (now usually made of ivory or hard wood), shaped like spoons, which are bound together by a band fastened on the thumb, and struck by the fingers to produce a thrilling sound during a dance in keeping with the rhythm of the music. The *krotalon* of the ancients was somewhat similar. The C. were introduced into Spain by the Moors, where they retain the name of castanulas, from their resemblance to the form of the chestnut. The C. are much used in ballet and opera.

CASTAÑOS, *kâs-tân'yōs*, Don Francisco Xavier de, Duke of Baylen: 1756–1852, Sep. 24; b. Madrid: Spanish general. He studied in Germany the military tactics of Frederick the Great. For some time after his return to Spain he had no opportunity of acquiring distinction; but when Napoleon I. invaded that country, Castanos received the command of a division of the Spanish army, and 1808, July 22, compelled 20,000 French, under General Dupont, to surrender at Baylen. It is asserted, however, that the merit of this prodigious success belonged more to Aloys Reding, a Swiss by birth, and the second in command. In Nov. of the same year Castanos was in turn defeated by the French at Tudela. The arrival of Wellington necessarily reduced him to a subordinate position, but he took part in the important battles of Albuera, Salamanca, and Vittoria. In 1811, he was appointed gen. of the 4th Spanish *corps d'armée*, and commandant of several provinces. In 1815, he was placed at the head of 80,000 troops, destined to invade France, some of which had already crossed the frontier when the news came of the battle of Waterloo. Although no great favorite with the court politicians, his ability could not be overlooked. In 1825, he was called to the state council, where he became a decided opponent of the Carlist party. He died at the age of 96.

CASTANOSPERMUM, *kăs-tā nō-spėr'mŭm* [Gr. *kastanon*, a chestnut; *sperma*, a seed]: genus of plants, named from the fancied resemblance of the seeds to the edible chestnuts of Europe. It comprises only one species, and belongs to the papilionaceous section of leguminous plants. It is found at Moreton Bay, in Queensland, Australia, where it grows to a height of from 40 to 50 ft. The pea-like flowers are produced in racemes, and are of a bright yellow color. The fruit is a pendulous cylindrical pod, six or eight inches in length, and tapering to both ends. It generally contains four seeds.

CASTAWAY, n. *kăst'ă-wā* [*cast*, and *away*]: a person lost or abandoned: Adj. shipwrecked; useless; of no value.

CAST—CASTING-LINE: in *angling*, a gut-line on which the artificial flies are fastened; made of several lengths of gut, knotted together, usually two to four yards long. The flies are attached at intervals of about two feet, and the line with its flies is called a *cast*.

CASTE.

CASTE, n. *kăst* [Port. *casta*, breed, race—from *casta*, as an adj., chaste, pure, in allusion to purity of breed—from L. *castus*, chaste]: a name applied to a section of the numerous classes into which the Hindoos are divided; a class or circle of persons in any community who chiefly hold intercourse within their own limits. CASTE-PREJUDICE, an exclusive feeling against social intercourse with those not of a similar rank or class.

CASTE, *kăst*: term applied chiefly to distinct classes or sections of society in India; in a modified sense, to social distinctions of an exclusive nature among the nations of the West. When, at the end of the 15th c., the Portuguese began to penetrate to India by the Cape of Good Hope, and to trade with the Deccan, or s. portion of the Indian peninsula, they found arbitrary social laws, full of intricate regulations which constantly interfered with their intercourse with the natives, especially in matters involving the *subdivision of labor*. They found certain pursuits invariably followed by a certain class, and any attempt to induce a man to perform offices not appointed for the class of which he was a member met with violent opposition, though such offices might, according to European notions, be more honorable than many he was content to fulfil. They observed, also, that these different classes often varied in appearance, the result, in some cases, of their addiction for many generations to the same pursuits; in others, of their having actually arisen from a different stock. Hence they applied to these various divisions of society the term *casta*—a Portuguese and Spanish word, meaning a breed. As applied to these classes of Hindu society, the word has passed into most European languages. From its frequent use in India, it has sometimes been erroneously considered of Hindu origin. In Sanskrit, castes are called *Varnas*, i.e., 'colors;' color being, no doubt, the chief distinction at first. Of late it has been spelled *caste*, but by old authors *cast;* and it is even a question whether the word may not be as genuine English, as *casta* is Spanish.

In the s. of India the Portuguese became acquainted with what is considered the most exaggerated evil of caste. There are found there large numbers of a class called *Pariahs*, or, in other districts of India, *Chandalas*. They are probably the relics of some early-conquered race, who have been degraded by uninterrupted ages of oppression, as is represented to have been the case with the Helots of Sparta, and peoples in a similar condition. These Pariahs were always identified with outcasts—i.e., persons who had forfeited the privileges of their original order. No one of any C. would have any communication with them. If one of them even touched a Nayr, or warrior of high C., he might with impunity kill him. Some sorts of food were defiled by even their shadow passing over them; and the name of Pariah or Chandala conveyed to the Hindu the idea of the utmost vileness and disgust. All who violated the institutions of their class were held to sink out of all caste into this class—a condition which involved the loss of all respectability and comfort. These regulations were, moreover, referred to religion.

As India was at this time "the land of the marvellous, and

its inhabitants, though as various as the different nations of Europe, were viewed by Europeans as one homogenious people, what was true of only one portion of the peninsula, was considered as prevailing everywhere, and as identical with the divisions of the Indians into *seven* tribes or castes, mentioned in olden times by Strabo, by Diodorus Siculus, and by Arrian. Nor was it forgotten that the Egyptians, whose early civilization was as undoubted as that of India, were also divided, according to Herodotus, into seven classes—priests, warriors, herdsmen, swineherds, tradesmen, interpreters, and pilots, to each of which were assigned particular districts.

About the middle of the 16th c., however, Abraham Roger, chaplain of the Dutch factory at Pulicat, gained the confidence of a Brahman acquainted with the Sanskrit language, and by this means learned almost exactly the account of the origin of C. given in the *Laws of Menu*, a work inferred to have been written not later than B.C. 900, long known only by name in Europe, until about the end of the last c., when a copy was obtained and translated by Sir William Jones. The whole of the Hindus are represented by Menu as divided into four classes :

1. The *Brahmans* or *sacerdotal class,* who are said, at the moment of creation, to have issued from the *mouth* of Brahma. Their business is reading and teaching the Vedas, and the performance of sacrifice for themselves and others. They are to be the chief of all created beings ; the rest of mortals enjoy life through them. By their imprecations, they can destroy kings, with all their troops, and elephants, and pomps. Indra, when cursed by one of them, was hurled from his own heaven, and compelled to animate a cat. Hence, the Brahman is to be treated with the most profound respect, even by kings. His life and person are protected by the severest laws for this world, and the most tremendous denuciations for the next. His own offenses are treated with singular lenity ; all offenses against him with terrible severity. He is forbidden to live by service, but on alms ; and it is incumbent upon virtuous men and kings to support him with liberality ; and all ceremonies of religion involve feasts and presents to him. The first part of his life is to be devoted to an unremitting study of the Vedas—books, be it observed, older than the code of Menu, and yet, except, perhaps, one of the later hymns, containing no mention of C. as a religious ordinance. He is to perform servile offices for his preceptor, and beg from door to door. In the second quarter, he lives with his wife, reads and teaches the Vedas, assists at sacrifices, and, 'clean and decent, his hair and beard clipped, his passions subdued, his mantle white, his body pure, with a staff and a copy of the Vedas in his hand, and bright golden rings in his ears,' he leads a studious and decorous life. The third quarter of his life he must spend in the woods, as an anchorite, clad in bark without fire, wholly silent, and feeding on roots and fruits. The last period he is released from external forms and mortifications, and is to spend his time meditating

on the divinity, until at length he quits the body, 'as a bird leaves the branch of a tree, at pleasure.'

2. The *Kshatrya*, or *Chuttree*, or *military class*, sprang from the *arm* of Brahma, and bear something of a sacred character. It is stated that the sacardotal order cannot prosper without the military, or the military without the sacerdotal; and the prosperity of both, as well in this world as in the next, is made to depend on their cordial union. The Kshatrya are to give alms, to sacrifice, to read the Vedas, and defend the people. Though Brahmans are to draw up and interpret laws, they are carefully excluded from administering them. The *executive* government is vested in the Kshatryas alone.

3. The *Vaisya*, or *Bais*, or *mercantile class*, sprang from the *thigh* of Brahma. Their grand duties are to keep cattle, carry on trade, lend on interest, cultivate the soil, and turn their attention to every description of practical knowledge. They are to be perfect men of business.

4. The *Sudras*, or *Sooders*, or *servile class*, came from the *foot* of Brahma. They are to serve the three superior classes, more especially the Brahmans. Their condition is never to be improved; they are not to accumulate property, and are unable by any means to approach the dignity of the higher classes. Utter and entire submissiveness to the Brahmans is the spirit of all a Sudra's duties, and this is to be enforced by penalties as severe as they are ridiculous. Yet, withal, the Sudras were not to be slaves, either public or private, and to occupy a position much higher than the Chandalas.

Mixture of castes, though not absolutely forbidden, entails disadvantages on the children, and the offspring of a Brahmanical woman and a Sudra becomes a Chandala, or outcast.

Such—omitting the minute and childish laws and penalties, many hundreds in number, by which it is proposed to carry the principle of C. into the pettiest affairs of life—is a brief outline of C., as gathered from the code of Menu. There is no historical evidence that it ever existed in this form, and, from the nature of the case we may conclude that it never did. In the *Toy-cart*, the oldest Hindu drama, no extravagant veneration for Brahmans anywhere appears. In fact, one of them is condemned to death; and the arrangements of society appear to have been the same as at present. The laws of C. form, it is true, a part of what is reputed to be Hindu law, but they have remained in all the states of India, Hindu as well as Mohammedan, to a great extent a dead-letter. There is nothing to show that the code of Menu was drawn up for the regulation of any particular state. Some have even conjectured that it may have been the work of some learned man, designed to set forth his idea of a perfect commonwealth under Hindu iustitutions, just as Plato in *The Republic* sets forth his idea of a model government under Greek institutions.

Be this as it may, the C. which at present exists throughout the greater part of India is very different from that

described in the code of Menu, though to that it owes, no doubt, much of its stability and its importance in the eyes of Europeans. With the exception of the Brahmans, the pure castes have disappeared, and out of the intermixture of the others have sprung innumerable classes, many of them unauthorized except by the people themselves. So ingrained in the whole community is this tendency to class distinctions that Mussulmans, Jews, Parsees, and Christians fall, in some degree, into it; and even excommunicated or outcast Pariahs form castes among themselves. Most of the existing castes partake of the nature of associations for mutual support or familiar intercourse, and are dependent upon a man's trade, occupation, or profession. Many of them have been described by Mr. Colebrooke in the *Asiatic Transactions*, vol. v. Many have had their origin in guilds, in schism from other castes, in the possession of a particular sort of property (as, for instance, landlords are spoken of as the C. of *zemindars*), and similar accidental circumstances. Their names are often due to the district in which the C. took its rise, to their founder, to their peculiar creed, or any random circumstance. In the Bengal presidency, there are many hundreds of such castes, almost every district containing some unknown in those adjacent. Among the lowest classes, and especially among the servants of the English at Calcutta, it has degenerated into a fastidious tenacity of the rights and privileges of station. For example, the man who sweeps your room will not take an empty cup from your hand; your groom will not mow a little grass; a coolie will carry any load, however offensive, upon his head, but, even in a matter of life and death, would refuse to carry a man, for that is the business of another caste. Such and many other regulations are described in every work on C., but, however annoying, are as unworthy of serious regard as are the assertions of self-importance found among little people all the world over. When a European or American servant pleads that such a work 'is not his place,' his excuse is analogous to that of the Hindu servant when he pleads his caste. When an Englishman of birth or profession, which is held to confer gentility, refuses to associate with a tradesman or mechanic—or when members of an association or order hold themselves largely aloof from others—or when any similar social distinction is established or urged, it would present itself to the mind of the Hindu as a regulation of caste.

Nor does C., at the present day, *tie a man down to follow his father's business*, except, perhaps, in the case of the more sacred functions of the Brahmans. For the rest, Brahmans serve as soldiers, and even as cooks. Men of all castes have risen to power, just as in England our statesmen have sprung from every class of society. Nor again, is loss of C. anything so terrible as has been represented; in most cases, it may be recovered by a frugal repast given to the members of the C.; or the outcast joins another C., among whom he will commonly be received with the

heartiness due to a new convert. In the East, C. enters into all the most ordinary relations of life. In the West, however, Christianity has ever tended gradually to ameliorate social differences, while the unpractical and unaroused mind of the Hindu has had a contrary effect.

These modified views of C., which have begun to prevail in recent years, will be found more fully developed in Shore *On Indian Affairs*, Irving's *Theory and Practice of Caste*. Full accounts of the petty regulations of C., as laid down in the code of Menu, may be seen in Sir William Jones's *Translation of the Code of Menu*, Robertson's *Disquisition on India*, Richard's *India*, Elphinstone's *History of India*, Dubois's *India*, Colebrooke's *Asiatic Transactions*, vol. v., and in various articles in the *Calcutta Review*. See above all the first vol. of Dr. John Muir's *Original Sanscrit Texts on the Origin and Progress of the Religion and Institutions of India; collected, translated by Notes* (5 vols.); and admirable illustrations of the system given in Sherring's *Hindu Tribes and Castes as represented in Benares* (3 vols., 1872–81).

CASTEGGIO, *kâs-tĕd'jo*, or MONTEBELLO: town of Piedmont, n. Italy, 5 m. e.n.e. of Voghera. In the campaign of 1859, Casteggio was occupied by Austrians prior to the battle of Montebello, in which they were defeated by the French and Sardinians. Casteggio was also valorously but unsuccessfully defended by the Austrians in the great battle of Montebello between them and the army of Napoleon I. 1800. As *Clastidium*, Casteggio was an important military position as early as the times of the Gallic and Punic wars. Some Roman antiquities still remain, and numerous curious inscriptions and coins have been found. Pop. 3,200.

CASTEL, *kâs-tĕl* (from Latin *castellum*, see CASTLE): name prefixed to various places in Italy, France, Spain, Portugal, etc.

CASTEL-ARQUATO, *-ar-kwâ'to:* town of Parma n. Italy, 19 m. s.e. of Piacenza, picturesquely situated amid forests and vineyards, with a fine Gothic church and a noble old castle, from which the town derives its name. It has manufactures of silk. Pop. 4,400.

CASTELAR Y RISSOLL, *kâs-tā-lâr' ē rĭssol'*, EMILIO: Spanish republican: b. Cadiz, 1832, Sept. 8., d. Murcia 1899, May 25. He received a limited education at home; subsequently studied in Madrid; early became known for his liberal, democratic, and socialist opinions; first distinguished himself as an orator in the revolution 1854; was appointed prof. of history in the Univ. of Madrid 1857; founded a democratic newspaper 1864; was condemned to death after the revolution 1866, but escaped to France; was active in the revolution 1868; and became a member of the cortes and leader of the republican party. After the abdication of King Amadeus, he became minister of foreign affairs 1873, Feb. 12; was elected pres. of the cortes Aug. 24; and was pres. of the republic

from 1873, Sep. 6, till 1874, Jan. 2. In the beginning of 1874 a hostile vote in the Cortes obliged him to resign, and soon after the *pronunciamiento* in favor of Alfonso XII. drove him across the frontier. He returned to Spain in 1876, and was returned to the Cortes, where, till his retirement in 1893, he often spoke with all his old eloquence. His chief writings are: *Civilization* (2d ed. 1865); *Questions, Political and Social* (3 vols. 1870); *Parliamentary Discussion* (3 vols. 1871); *History of the Republican Movement in Europe* (2 vols. 1874); *The Oriental Question* (1876).

CASTEL-BOLOGNESE, *-bo-lōn-yā'sā:* town of n. Italy, about 22 m. w.s.w. from Ravenna. It derives its name from a strong fortress built here by the Bolognese in the 14th c.; and is historically famous as the scene of a decisive battle between the Milanese and Florentines 1434, in which the latter were completely vanquished.

CASTEL-BUONO, *-bô-ōn'o:* town of Sicily, province of Palermo, eight m. s.e. of Cefalu; noted for its mineral springs. It has a trade in manna. Pop. 8,439.

CASTEL-FRANCO, *-frân'kō:* town of central Italy eight m. e. of Modena, with the old walls and ramparts of, a castle built by Urban VIII., and near the site of the battle between the consuls Hirtius and Pansa and Mark Antony.

CASTEL-GANDOLFO, *-gân-dol'fo:* village of the former Papal States, 11 m. s.e. of Rome, near the w. shore of Lake Albano. Its situation is extremely picturesque, and it commands extensive views of some of the most beautiful scenery in Italy. The pope has his summer residence here. In early times, the noble family of the Savelli had a stronghold at C., by means of which, for a period of nearly 400 years, they bade defiance to popes, barons, and *bourgeoisie*. Pop. 1,144.

CASTELLAMARE, *kâs-tĕl'â-mâ'rā:* fortified city and seaport of s. Italy, about 17 m. s.e. of the city of Naples. It is built on the lower slopes of Monte d'Auro, and along a sheltered beach on the s.e. side of the Gulf of Naples, over which it commands a magnificent view. It is on or near the site of the ancient *Stabiæ*, which was desolated by Sylla during the social war, and where the elder Pliny afterward lost his life when the city was overwhelmed with lava from Vesuvius. Some ancient remains have been found here. The town was sacked in the 15th c., by Pope Pius II., and again in the 17th c. by the Duc de Guise. It has a royal palace, a cathedral, several convents, among which that founded by Gonsalvo de Cordova, in the 16h c., is famous for the possession of an image of the Madonna (found in a well in the 11th c.), which is greatly venerated by the peasantry, who make an annual pilgrimage to the church. The old castle, which gave name to the town, was built in the 12c. C. has a royal dockyard, affording employment to many of the inhabitants, and manufactures of linen, silk, cotton, leather, and sail-cloth. Pop. 25,000.

CASTELLAMARE town in Sicily, at the head of a gulf of the same name; 20 m. e. from Trapani. It exports cotton, wine, fruit, and manna. Pop. 11,280.

CASTELLAMARE, Gulf of: an extensive bay on the n. coast of Sicily. Its width from e. to w., between Point Uomo Morto and Cape St. Vito, is about 15 m.; and its depth about 14 m. It has deep water and good anchorage, but is much exposed to n. winds.

CASTELLAMONTÉ, *kâs-tĕl'lâ-mŏn'tā:* town of n. Italy, province of Turin, 10 m. s.w. of Ivrea. It has an old castle, manufactures of earthenware, and a trade in the agricultural produce of the district. Pop. 2,500.

CASTELLAN, n. *kăs'tĕl-ăn* [Sp. *castelláno*, the warden of a castle], the governor or warden of a castle or *burg;* called also *Châtelain.* The office and the rank of the castellan were various in various countries. In France and Flanders, the titles castellan belonged to the holders of certain demesnes, and was next in order of rank to that of a bailiff. In Germany, the castellan had the jurisdiction of a burg-graf during the ages of chivalry. In Poland, the title of castellan with its appendages, remained in later times, and, after the 16th c., the castellans, with the waiwodes and bishops, formed the senate or superior legislative chamber. Castellany, n. *kăs'tĕl-ln-ĭ,* the lordship of a castle with its land and jurisdiction.

CASTELLANA, *kâs-tĕl-lâ'nâ:* town of s. Italy, province of Bari, 26 m. s.e. of the city of Bari. Its trade is confined to the produce of the district. Pop. 8,092.

CASTELLANETA, *kâs-tĕl-lâ-nāt'â:* town of s. Italy, province of Lecce, 20 m. n.w. of Taranto. It has a cathedral and several convents. Cotton is grown in the district. Pop. 7,913.

CASTELLATED: see under Castle.

CASTELLIO, *kâs-tāl-yo'*, or CASTALIO, *kâs-tâ-lyo'*, Sebastianus: 1515–63; b. in Dauphiné: theologian. His proper name was *Châteillon,* which he Latinized, according to the usage of his time. About 1540, he was invited to Geneva by Calvin, and appointed humanity professor; but having the misfortune, afterward, to differ from the reformer in religious opinion, he was banished from the city, and went to Basel, where he spent the rest of his life in great poverty: see Calvin.

Among his various writings are *De Hæreticis,* etc.—a treatise which argues against the right of the magistrate to punish heretical opinions, and which produced a reply from Beza; a Latin version of the Old and New Testaments, 1551, dedicated to Edward VI. of England; and a posthumous work, in dialogue, on predestination, election, free-will, and faith, first published by Faustus Socinus 1578.

CASTELLO, *kâs-tĕl'lo,* Giovanni Battista: 1500–69; b. Bergamo, Italy: painter. He decorated the Nunziata di Portoria in Genoa, the saloon of the Lanzi palace at

Gorlago, and the Pardo palace in Spain. His best known pictures are the *Martyrdom of St. Sebastian* and the *Judge of the World* in the Nunziata at Genoa. He was also sculptor and architect, and in the last capacity was invited, 1567, by Philip II. to Madrid, and died there.

CASTELLO, VALERIO: 1625–59; youngest son of Bernardo C. (1557–1629), a Genoese painter, whom Valerio surpassed. He was best in battle scenes, which were supposed to combine the fire of Tintoretto with the style of Paul Veronese. His *Rape of the Sabines*, in the Brignoli palace at Genoa, was painted on the same day in which he decorated the church of the Annunciation.

CASTELLON, *kâs-tĕl-yōn′:* province of Spain, part of the ancient kingdom of Valencia, bounded on the n. by Tarragona, e. by the Mediterranean, s. by Valencia, and w. by Teruel, 2,447 sq. m. It is mountainous, watered by the Mijares, Palencia, and other small streams, and has many mines and mineral springs. The cultivated parts produce grain. Chief towns, C. de la Plana, Benicardo, Villareal, and Burriana. Pop. abt. 305,000.

CASTELLON DE LA PLANA, *kâs-tĕl-yōn′ dā lâ plâ′nâ:* town of Spain, cap. of the province of the same name: in the midst of a fruitful plain, about 4m. from the Mediterranean, 40 m. n.n.e. of Valencia. A magnificent aqueduct supplies irrigation. C. is surrounded by walls, and is for the most part well built. It has some handsome old churches, and a singular bell-tower 260 ft. high. Ribalta, celebrated Spanish painter, was a native of Castellon de la Plana. It has manufactures of linen, woolen, sailcloth, paper, earthenware, and firearms; also brandy distilleries, and an active trade. Pop. 31,000.

CASTELNAU, *kâs-tĕl-nō′*, MICHEL DE, Sieur DE LA MAUVISSIERE: about 1520–92; b. Touraine. French soldier and diplomatist: his grandfather was equerry to Louis XII. He was well educated, travelled in Italy, and visited Malta. Entering the army he served in the Italian campaigns, was patronized and employed by the cardinal of Lorraine, received a naval command 1557, declined knighthood, and rejoined the French army in Picardy. The Constable de Montmorency intrusted him with several delicate missions, in which he won such credit that Henry II. sent him to Scotland with despatches for Mary Stuart, then betrothed to the dauphin, to England to treat with Elizabeth concerning her claim to Calais, and to Germany to estrange the princes from the Protestant cause. After this he went on missions to Margaret of Parma in the Netherlands, to Savoy, and to Rome, where he promoted the election of Pius IV. He reëntered the French navy, and at Nantes detected and reported the first signs of the conspiracy of Amboise. Francis II. having died 1560, C. attended Queen Mary to Scotland and spent a year there, giving her much good advice and endeavoring to remove the ill-will between her and Elizabeth, whom he several times visited in this

interest. Returning to France, 1562, he was sent against the Protestants in Brittany, and made prisoner, but soon exchanged. Throughout the religious troubles he counselled the govt. to moderation. He served at the siege of Rouen and the battle of Dreux, took Tancarville, and helped retake Havre from the English, 1563. Other missions followed—to Elizabeth to negotiate a peace, to Alva in the Netherlands, and to Germany to secure aid against the Protestants. He discovered the plot of Condé and Coligny to carry off the royal family, 1567; was made gov. of St. Dizier and capt. of a company, and bore part in the battles of Jarnac and Moncontour. To assuage the excitement caused by the massacre of St. Bartholomew, Charles IX. sent him, 1572, to England, to Germany, and to Switzerland. 1574–84 he was ambassador to Elizabeth, and endeavored to bring about her marriage to the Duke of Alençon, but learned to distrust her promises. Returning to France, he would not bow to the League and was deprived of his governorship by the Duke of Guise; this and the destruction of his chateau in the civil wars brought him to poverty. On Henry IV.'s accession, Castelnau received a command in the army, and was sent on several missions. He died at Joinville. His *Mémoires*, written in England for his son, cover the years 1559–70, and are clear, vivacious, and impartial. They were first printed 1621; enlarged to 2 vols. folio; 1659; again enlarged to 3 vols. folio, 1731. Castelnau translated Ramus's Latin book on the *Manners and Customs of the Ancient Gauls*. Some of his letters are preserved in the Cottonian and Harleian collections in the British Museum.

CASTELNAUDARY, *kâs-tĕl-nō-dâ-rē′:* town in the dept. of Aude, France; on a declivity, skirted at the base by the Canal du Midi, 22 m. from Carcassone. It has manufactures of woolen and silk fabrics and earthenware, and a lively trade in agricultural produce. The canal at this point expands into a large basin, which serves as a haven. C. suffered dreadfully in the crusade against the Albigenses, and was, in 1212, the scene of a battle between Simon de Montfort and Raymond, Count of Toulouse. In 1355, it was captured by the Black Prince. In 1632, Marshal Schomberg here gained a victory over the party of the Duke of Orleans, when the brave Duke of Montmorency was taken prisoner, and afterward put to death at Toulouse. Pop. 10,000.

CASTELNUOVO, *kâs-tĕl-nô-ō′vō:* seaport town of Dalmatia, Austria; near the w. entrance of the Gulf of Cattaro: surrounded by walls, and defended by two forts and a citadel. It has manufactures of brass and a trade in the produce of the district, which is fertile. It was captured by the British 1814. Pop. about 10,000.

CASTELRY, n. *kăs′tl-rĭ*: the tenure and jurisdiction of a castle; the domain pertaining to a castle.

CASTEL-SARRASIN, *-sar-râ-săng′:* town of France,

dept. of Tarn et Garonne; on the Songuine, 12 m. w. from Montauban. It has the remains of an old castle said to be of Saracenic origin, manufactures of serge and worsted stockings, and a trade in the agricultural produce of the district. Pop. abt. 4,000.

CASTEL-VETRANO, *-vā-trâ′no:* town of Sicily, province of Trapani, 20 m. s.e. of the town of Trapani. It is an interesting place with an old castle, several convents, and manufactures of articles of coral and alabaster. Some of the most esteemed white wine of Sicily is produced in the vicinity. Pop. 25,000.

CASTER, n. *kăs′tėr* [see CAST]: one who casts; a small spice bottle or cruet; a stand to hold cruets. CAS′TERS, n. plu. small wheels attached to the legs of sofas, tables, etc.; sometimes written CAS′TORS.

CASTIGATE, v. *kăs′tĭ-gāt* [L. *castigātus*, kept chaste, corrected, chastized—from *castus*, chaste, pure; It. *castigare*]: to correct or chastise; to criticize severely in writing; to punish with stripes. CAS′TIGATING, imp. CAS′TIGATED, pp. CAS′TIGA′TION, n. *-gā′shŭn*, correction or punishment administered by writings or words; a whipping. CAS′TIGATOR, n. *-tėr*, one who. CAS′TIGA′TORY, a. *-ter-ĭ*, corrective: N. the thing used in correction.—SYN. of 'castigation': punishment; correction; chastisement; discipline.

CASTIGLIONE, *kâs-tēl-yō′nā:* town of Sicily, province of Catania; on the n. slope of Mount Etna, on the right bank of the Cantara, 35 m. s.w. of Messina. The town stands on a square rock rising abruptly from the valley, and having a double crest, on which stand a domed church and the ruins of a feudal castle. Here, in 1297, in the war of the vespers, Admiral Roger Toria raised the standard of rebellion against his sovereign, Frederick of Aragon. In the district are several large nut-plantations, which produce the best Sicilian hazel-nuts. Pop. 8,000.

CASTIGLIONÉ: village of Italy, on the Stiviere, and near the Lago di Garda, 16 m. s.e. of Brescia. Here the Austrian vanguard under Wurmser was defeated 1796, Aug. 3, by the French under Augereau, and the main army two days later by Bonaparte. The battle of Solferino, 1859, June 24, had nearly the same field.

CASTIGLIONE, *kâs-tēl-yō′nā*, BALDASARRE′, Count: 1478–1529; b. Casatico, in the duchy of Mantua: one of the most elegant of the old Italian writers. He studied at Milan. His shining talents, knowledge, and pleasing manners made him a favorite of Guidobaldo di Montefeltro, Duke of Urbino, a great patron of literature, at whose court he was honorably entertained, with other men of eminence in letters. He was employed by the duke as envoy to Henry VIII. of England, who made him a knight, and was afterward sent in the same capacity to Louis XII. of France, under Guidobaldo's successor, in several important ambassadorial missions. He died at Toledo. His chief work is the book *Del Cortgeiano*, a manual for courtiers, remarkable for

its elegant style. His Italian and Latin poems are also models of elegance, and his *Letters* (2 vols., Padua, 1769–71) contains interesting contributions to the political and literary history of his time. Tasso devoted a sonnet to the death of C. and Giulio Romano raised to his memory a monument in Padua.

CASTIGLIO'NE, Carlo Ottavio, Count: 1795–1849, Apr. 10; b. Milan: philologist. He early showed a predilection for antiquarian studies, particularly numismatics. When only 24 years of age he published a description of the Kufic coins in the cabinet of Brera, Milan, under the title, *Monete Cufiche del Museo di Milano* (Milan, 1819). C.'s principal work in oriental literature is *Mémoire géographique et numismatique sur la Partie orientale de la Barbarie appelée Afrikiah par les Arabes, suivi de Recherches sur les Berbères Atlantiques* (Milan, 1826), in which he seeks to ascertain the origin and the history of the towns in Barbary whose names are found on Arabic coins. Out of Italy C. is best known by his edition of some fragments of the Mœso-Gothic translation of the Bible by Ulphilas (q.v.), which had been discovered, 1817, by Cardinal Mai among the palimpsests of the Ambrosian library. At first he published some specimens in conjunction with Mai, but in 1829, '34, '35, and '39 appeared a variety of fragments of the Pauline epistles, edited by himself, and enriched with valuable disquisitions, commentaries, and glossaries. He died at Genoa.

CASTIGLIO'NÉ, Giovanni Benedetto: 1616–70; b. Genoa: painter: called Il Grechetto. He studied under Vandyck, and painted portraits, landscapes, and historical pieces, but was best in fairs, markets, and animals. His works are found chiefly in Genoa and Mantua, but also in Rome, Venice, Florence, and Naples; eight are at the Louvre. *The Nativity*, in the church of San Luca at Genoa, is among his best. His etchings, full of spirit and remarkable for light and shade, earned him the name of a second Rembrandt: *Diogenes Seeking a Man* is an example of them. C.'s later years were spent in painting for the court at Mantua, where he died. Many pictures ascribed to him may be copies, or by his brother Salvatore or his son Francesco.

CASTIGLIONE, *kâs-tēl-yō'nā*, Lake of: lagoon of central Italy, province of Siena. It lies north of Grosseto; length about 10 m., breadth one to three miles. Receiving the waters of the Bruna and other rivers, it discharges its water by a short canal into the Mediterranean.

CASTIGLIONE DELLE STIVIERE, *kâs tēl-yō'nā dĕl'-lā stē-vē-ā'rā:* town of n. Italy, 22 m. n.w. of Mantua. It is walled and defended by an ancient castle; but is noted chiefly for the victory obtained here by the French over the Austrians 1796, which gave the title of Duc de Castiglione to Marshal Augereau. Pop., 4,000.

CASTILE, *kâs-tēl'* (Spanish, Castilla, *kâs-tēl'yâ*): in a geographical and political point of view, the central district of the Spanish peninsula, being the middle and most strongly-marked plateau of Spain, as well as the central seat of the monarchy. Both geographically and po-

litically it is divided into Old and New Castile—*Castilla la Vieja* and *Castilla la Nueva*. The former district, in 40° 5′–43° 32′ n. lat., and 1° 40′—5° 35′ w. long., rises, in the form of an elevated plateau, to the height of 2,500–3,000 ft. It is walled in on all sides: on the n., by the highest masses of the Cantabrian Mountains, which separate it from the Basque provinces and Asturias; on the s., by the high ridge forming the water-shed between the Douro and the Tagus; while the Sierras de Oca, de Urbion, and Moncayo, and the heights of Leon and Tras-os-Montes bound it on the e. and w. The high plateau of Old C. is scantily watered, and its natural characteristics far from inviting. In many parts, nothing is presented to the eye but a wide, unwooded, almost treeless waste of land, unrefreshed by streams, in some parts monotonously covered with stunted grasses, and in others, almost destitute of vegetation. The traveller may walk many miles without finding a village, or even a solitary farm-house. All Old C., however, is not a dusty desert. There are rich tracts in it producing some of the finest wheat in the world. Madder and grasses also are produced abundantly in some parts; and even the olive flourishes where it is protected from the frost and snow of winter, and from the cold winds in Oct. and the following months. Iron and other minerals exist in plenty, but are not worked to any great extent. Sheep, cattle, pigs, and mules form the chief wealth of the inhabitants. Manufactures consist of coarse woolens, cotton, linen, leather, and glass.

The plateau of New Castile—between lat. 38° 23′ and 41° 15′ n., and long. 1° and 5° 25′ w.—like Old C., is inclosed by mountains. Though lying 1,800 ft. lower than Old C., New C. presents many similar characteristics of soil and scenery. It is mostly sterile, and scantily irrigated; little rain falls, and the nightly dews are insufficient to refresh the plains, which are entirely destitute of trees, and, in summer, appear quite burned up. Olives, corn, pulse, and saffron, are cultivated in some neighborhoods; but flocks of sheep are the chief wealth of extensive tracts of land. The commerce, carried on by means of long trains of mules, reminds the tourist of the caravan-traffic over eastern deserts. Industry is restricted almost entirely to manufactures of coarse woolen goods. The yield of the salt-mines in the s. is considerable; and quicksilver, especially at Almaden (q.v.), and iron (manufactured at Toledo) are plentiful. The Castilians have even more than the general haughtiness of the Spanish character. Their language prevails throughout the educated classes, as in the literature of Spain, and their rulers have extended their sway over the whole nation.

C. became an independent country first in 762, and remained so till 1028, when it passed to Sancho III., King of Navarre. His son, Ferdinand I. (the Great), founded the kingdom of C., and among other acquisitions, annexed to it the kingdom of Leon. This union, however, was not permanent, Leon being made a separate kingdom for Ferdinand II. The two kingdoms, however, were reunited in the 13th c. in the person of Ferdinand III., and remained ever after under one sceptre. Among the succes-

sors of Ferdinand III., the most distinguished was Alfonso X., by whose direction the Alfonsine (astronomical) tables were drawn up. By the marriage of Isabella, sister and successor of Henry IV., with Ferdinand, King of Aragon (1469), the two crowns of Castile and Aragon became united (1479), and from these sprang the kingdom of Spain, which, however, was not fully established before the death of Ferdinand, 1516, when Charles I. of Spain (Charles V. of Germany) inherited both crowns.

In the present administrative division of Spain into 49 provinces, the division of Old and New Castile, though it will long be remembered by the people, is one belonging to the past. Beside the 13 present provinces, the kingdom of Leon, Galicia, the principality of Asturias, and the district of Estremadura, Andalusia, Granada, and Murcia, belonged to the crown of Castile.

Old Castile is now divided into the eight provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid; total 25,400 sq. m. Pop. 1,717,402.

New Castile includes the five provinces—Madrid, Guadalaxara, Cuença, Toledo, and Ciudad Real; total 20,200 sq. m. Pop. 1,780,003.

CASTILE-SOAP, n. *kăs-tēl′* [from *Castile* in Spain]: a very pure variety of soap. Castilian, a. *-tĭl′ĭ-ăn*, of or from Castile; N. a native.

CASTILLEJO, *kâs-tēl-yā′cho*, Christoval de: 1494–1556: Spanish poet; b. Ciudad Rodrigo. He was sec. to Ferdinand of Austria, bro. of Charles V., afterward king of Hungary and Bohemia, and ultimately emperor of Germany. Though a priest, Castillejo wrote in a strongly anti-clerical vein; the Inquisition suppressed large portions of his MS. satires and filled the spaces with doggerel of its own rhymsters. Castillejo had wit, grace, and charm, but was too voluminous and often trivial. He resisted the inroads of Garcilaso de la Vega and the new school, and confined himself to the old metrical forms, notable for ease and simplicity. His poems, in three books, treating respectively of love, conversation, and pastime, and moral and sacred themes, appeared 1573, 1598, 1600; best edition, Madrid, 1832.

CASTILLON, *kâs-tē-yōng′:* town of France, dept. of Gironde; on the right bank of the Dordogne, 26 m. e. of Bordeaux. It has manufactures of cotton and woolen yarns, nails, and cordage. It was the scene of the battle between the forces of Henry VI. of England and Charles VII. of France, 1453, July, in which the English met with signal defeat, their leader, the Earl of Shrewsbury, and his son, being slain. Of all their possessions in France, Calais alone remained to the English after this battle, the incidents of which were seized on by Shakespeare for the sixth scene in his play of *King Henry VI., part I.* Pop. 3,000.

CASTINE, *kăs-tēn′:* seaport town of Hancock co., Me., on the e. side of Penobscot Bay, at the mouth of the Penobscot river, 34 m. s. of Bangor and 9 m. e. of Belfast. It was settled 1667 by a French colony under the Baron de Castine; abandoned in consequence of troubles with the Indians and English; resettled by the English, 1760; taken by the British during the revolution, and again 1814. Its site is a peninsula inclosing a spacious harbor, capable of receiving vessels of the largest size. Castine has some trade, and industries in boat-building and fishing. It contains a custom-house, a state normal school, and several churches. Pop. 1,000.

CASTING, the running of melted metal into a mold, so as to produce an object in metal having the shape of the mold. Iron-casting or iron-founding is carried on by three methods, the first called 'open sand-casting,' the second, 'sand-casting between flasks,' and the third, 'loam-casting.' In most of these an exact pattern, usually of wood, is employed by the founder. The floor of every foundry is composed, for several feet deep, of a loamy sand, in which deep pits may be sunk to bury large molds. This floor must be kept exceedingly dry, and free from any wet or moisture, otherwise the melted matter, converting the watery particles into vapor, would blow up the building and destroy the workmen. In the place where the mold is to be made, a layer of sand is lightly sprinkled through a sieve on the floor, and the wooden pattern pressed firmly down into it, level with the surface. The sand is then to be shoveled up all around, level with the top of the pattern, and rammed down with a tool. A moist sponge is then used for slightly wetting the sand all round the edges of the pattern, to make its particles adhere together. The next operation is lifting the pattern out of the sand by one or more screws, screwed into the wood. If the pattern be small, this can be easily done by one or more men; but in very large works it is effected by a crane. The workman then uses a pair of bellows for blowing away any small pieces of sand which may have fallen into the mold, and then sifts some finely powdered charcoal over its surface. It is now ready for filling with metal. In small works this is done by ladles and in large by small channels made in the sand, leading from the mold to the mouth of the furnace. When the mold is filled, the hot metal is covered with sand to keep the air from it while it is cooling.

Sand-casting between flasks is used for more complex articles than the former; such, for instance, as if they were cut into two or more pieces (provided the cutting planes were parallel to each other), each separate piece might be cast in open sand. The flasks are iron frames furnished with four handles, by which they may be lifted, and having iron points fitting into holes prepared in the other flask for joining them accurately together. The under flask being placed upon a board, filled with sand,

and the sand rammed tight into it, the workman then takes the pattern and presses one half of it into the sand, and smooths the sand up to the sides of it with a trowel; he then sets the empty flask over the other, adjusting its points to the holes, and after sprinkling some sand which has been burned (to free it from moisture) over the sand in the under flask, he fills the upper one with sand and rams it down; he next, with a piece of wood, put through the sand in the upper flask, makes a hole to pour the metal through. The upper flask, with the sand in it, is then raised off by men by the handles, or in large works by a crane, and the pattern lifted out. The flask is then put on again, and heavy weights laid upon it to keep it down ready for casting. It must be observed that at every uppermost point of large molds a small hole must be bored through the sand in the upper flask, to allow the rarefied air to escape out of the mold when melted metal is poured in. To save expense it is now customary to make flasks of any size that may be wanted, out of rectangular iron plates, which are fitted together by means of screws and bolts. This obviates the necessity of keeping a large store of flasks of different sizes, and enables the caster to adapt the form of the flask to that of the model for which it is intended.

Loam-casting is used for bulky, hollow articles, such as cylinders, large pipes, caldrons, boilers, etc., and is conducted in this manner: If, for instance, a large cylinder is to be cast, a mold has first to be made as follows: To a beam in the roof of the foundry is affixed a perpendicular spindle, with three or four holes through it to fix an iron arm in, at different heights, by means of a nut. This arm has two bars placed at such a distance as to be capable of receiving a wooden plank, which can be firmly secured to them by means of two clamps. The operation is then begun by laying an iron ring upon the ground, and adjusting it so as to be concentric to the spindle. A cylinder of brickbats, or clay and wet loam (instead of mortar), is then built upon it, some inches less in diameter than the intended cylinder, for which this is to form a core; the brickbats are then firmly bound together with iron hoops, annealed wire, etc., and a fire is lighted within the erection to dry it. When the loam used between the bricks is dry, a coating of loam is spread over the whole, and is perfectly smoothed by causing the edge of the perpendicular board to revolve round it. This coat makes it of the proper size for the inside of the cylinder to be cast, and is called the core of the mold. Another cylinder is built, plastered, and smoothed in the same way (except that no hoops are used), whose diameter is the same as the outside of the cylinder to be cast. When this is finished it is covered with a coating of charcoal, ground up with water like paint, laid on with a brush, and a thin coating of loam is laid on; this is bound round with hoops, and to these four hooks are fixed to lift it by; a thick coat of loam and hair is then laid over it.

When all these are dry a man gets down into the cylinder, and with a small pick pulls down all the bricks in the inside cylinder, and then with a trowel cuts away all the loam, leaving the inside of the external cylinder (which is called the mold) quite smooth. This is effected by the coating of powdered charcoal, which prevents the two coats of loam from adhering. A deep pit is now dug in some convenient part of the foundry, into which the core is let down by a crane. The core being placed in the pit, the mold is let down after it by the same means; and when they are adjusted, the sand is thrown and rammed round about half the height; a flat cover of dried loam is then put on the top of the mold and core, and round pieces of wood are put in the holes which had before been made in the cover for pouring the metal in. The burying of the mold is then completed. When it is all leveled, the sticks which keep open the holes for the metal are carefully withdrawn, and small channels made from the furnace to allow the melted iron to find its way to the mold.

CASTING, in Angling: act of throwing a fly or a fish bait. See CAST—CASTING LINE. In casting a fly with a single-handed rod, the beginner should let out about as much line as the length of the rod; grasp the rod just above the reel; then wave it back over the right or left shoulder, with a slightly circular sweep, so as to extend the line behind; and then bring it forward with a steady cutting kind of action, urging the point of the rod toward the spot where the fly is to fall, taking care not to carry the point of the rod too far forward, or too low, or the line will not fall straight and evenly on the water. The object of the circular sweep behind is to prevent the fly from cracking off. By slightly raising the point of the rod just as the fly is delivered, the line is straightened; and the fly, checked in mid career, falls like thistle-down upon the water.

In casting a bait, either for spinning, trolling, or live-baiting, the bait is allowed to hang from the point of the rod about a yard. Taking the rod in both hands, the line clasped to the rod in his right, the angler waves the bait gently back; and having first drawn as much line as he requires off the reel, and laid it loosely at his feet, he sends the bait forward with a swing toward the point that he desires to reach.

CAST'ING-NET: species of net used in fishing. A usual size for nets is 13 to 20 ft. in circumference. They are netted in the shape of a long, loose bag or cone; and so much is the number of meshes increased as the net is being formed that it is capable of being spread out in a perfectly flat and circular form, the apex of the cone forming the centre of the circle. To this apex is attached a rope of some yards in length; when casting, this rope is fastened round the left wrist of the caster. The bottom of the net is hung

with perforated leads or bullets. These not only sink the net to the bottom of the water, but, also, when it is cast, cause it to spread open. The bottom of the net is turned up six inches or more in depth, and hung up on the inside, about every ten inches to an upper portion of the net, by stout strings, so as to form a kind of purse; this is called the 'tuck.' When the net is required to be cast, the caster, having fastened the rope to his wrist, and coiled it loosely in his left hand, hangs a portion of the net over his left shoulder; and then gathering as much of the outer edge of the net as he can collect in his right hand, and holding it up so as to open the net as much as possible, makes a semicircular sweep of the body and the right hand—rather difficult to accomplish without practice—and whirls the net away off the shoulder. The centrifugal motion thus communicated to the leads, etc., on the bottom of the net, causes it to open like a circle on the surface of the water, the leads carry it to the bottom, and the net thus covers all that comes within its circle. The rope is then pulled gradually, and worked from side to side, in order to narrow the circle, to bring it once more into a cone; and, in their efforts to escape, the fish that may have been covered are gradually driven into the tuck or purse of the net. When the leads are all close together, the net is lifted from the water, and the fish in the tuck are taken out. The cost of a casting-net is regulated by the circumference and the size of the mesh.

CAST'ING-VOTE: the deciding vote, which is usually a part of either the duty or the prerogative of the chairman or president of a meeting, by which he *casts* the balance on one side or the other, when the votes of the assembly are found equally divided. In the British house of commons, the speaker does not vote at all unless this occurrence takes place. As his position in this respect is felt to be delicate for a person whose duty it is to withdraw himself from the contentions of party, it is usual for the speaker to vote in such a way as to give the house an opportunity of reconsidering its decision. The same rule prevails in select committees. Following a similar rule, the chairman at corporation and general meetings usually gives his casting-vote either in a way that will lead to a reconsideration of the subject, or for what seems the popular view of the case, although that may be at variance with his convictions. In the U. S. senate the presiding officer has no vote when a majority vote has been given, but gives his casting-vote in case of an equal division.

CAST-IRON, or PIG-IRON: crudest form of iron: for the method of its production, see IRON. There are two leading kinds of it—namely, white pig-iron and gray pig-iron; the former is called also forge-iron, from being chiefly used for conversion into malleable iron and steel; and the latter is often called foundry-iron, from its suitability for castings. Of each of these, again, there are many varieties; and much light has of late years been thrown on what constitutes their different qualities, by experiments in the

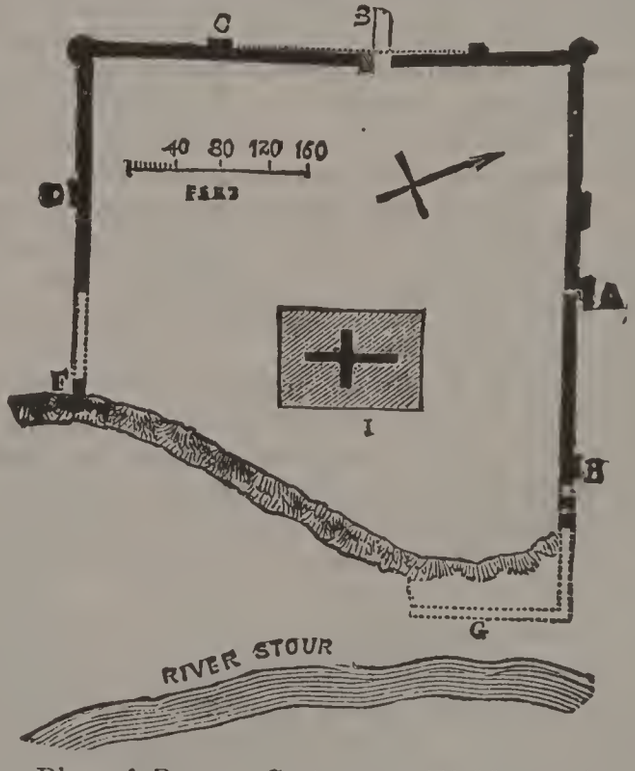
manufacture of steel. White cast-iron, when smelted from the argillaceous ores of the coal-measures, is of inferior value to the gray; much of it, indeed, being produced against the will of the ironmaster, when the blast-furnace is working badly. But when obtained from pure ores and fuel it is the most valuable kind, because it contains fewer impurities, and has its carbon nearly all in the combined state, in which case it is best suited for the manufacture of wrought-iron and steel. Gray pig-iron contains carbon both in the combined and the uncombined (graphitic) state. In the grayest kind, uncombined carbon greatly prevails, and the fracture of the iron is more distinctly granular or scaly-crystalline than is the case with other varieties. Such cast-iron is usually called No. 1. It is much softer, but fuses at a higher temperature than white pig-iron. It also becomes thinly liquid when melted, and expands slightly just before cooling—properties which render it extremely valuable for castings. As the grayness and graphite-like brightness diminish, the iron is known as No. 2, No. 3, and so on for several numbers, down to the close texture and light color of white pig-iron, No. 2 being but slightly different from No. 1, and No. 5 from white-iron in quality. No. 3 is intermediate between the extremes. When cast-iron is partly gray and partly white, it is called mottled iron. Cast-iron contains two to three per cent. of carbon, the maximum amount in steel being two; but steel is practically free from silicon, sulphur, and phosphorus, while cast-iron is not. The production of pig-iron in the United States in 1905 was 22,992,380 long tons. Of this Pennsylvania produced 10,579,127 long tons; Ohio, 4,586,110 long tons; and Illinois, 2,034,483 long tons.

CASTLE, *kăs'sl*, EDMUND, English Orientalist: b. 1606; d. about 1685. His life was spent mainly in the compilation of his *Lexicon Heptaglotton Hebraicum, Chaldaicum, Syriacum, Samaritanum, Æthiopicum, Arabicum et Persicum* (1669), the Syriac division of which is still considered valuable, and he also aided Walton in the preparation of his *Polyglot.*

CASTLE, EGERTON, English author: b. 1858, March 12. He was educated at Glasgow University and Cambridge. After a brief military career he turned to literature and journalism, and has written: *Schools and Masters of Fence* (1884); *Bibliotheca Dimicatoria* (1891); *Consequences* (1891); *La Bella and Others* (1892); *English Book Plates* (1892); *Saviolo,* a play (1893); *The Light of Scarthey* (1895); *The Jerningham Letters* (1896); *The Pride of Jennico* (1898); and *Young April* (1899); *Desperate Remedies,* a play; *The Bath Comedy* (1899); *Marshfield the Observer; The Secret Orchard* (1900); *The House of Romance* (1902); *The Rose of the World* (1904). The last-named novel, with *The Pride of Jennico* and *The Bath Comedy,* were written jointly by Mr. Castle and his wife, Agnes Castle.

CASTLE, n. *kăs'sl* [It. *castello;* L. *castel'lum;* Sax. *castel,* a fortified place—from L. *castra,* a camp]: a building fortified; a fortress; one of the pieces in chess. CASTLED, a. *kăs'sld,* furnished with castles. CASTELLATED, a. *kăs'-tĕl-lā'tĕd,* having turrets and battlements like a castle. FORE-CASTLE, n. *fōk'sl* [*fore* and *castle*]: a short deck in the fore part of a ship, at one time a castle. CASTLE IN THE AIR, an empty scheme; the forming of hopes on no solid foundation; visionary expectations. CASTLERY, n. *kăs'-sl-rĭ,* government of a castle. CASTLE-BUILDING, the forming in the mind of wild or visionary schemes. CASTLE-BUILDER, one who builds castles in the air; one who forms imaginary ideas and pictures. TO CASTLE, in *chess,* to cover the king by a certain move.—SYN. of 'castle': fortress; fortification; stronghold; citadel.

CASTLE, *kăs sl:* building constructed with a view to repelling attack. The root of the word is the same as that of *casa,* a little house or hut, and probably means a driving off or repelling; and it is worthy of notice, in confirmation of this view, that in Welsh the radical syllable *cas,* signifies a castle, separated, also hatred, malice, etc. The *castella,*



Plan of Roman Castrum at Richborough:

A, postern gate; B, decuman gate; C, D, square towers; F, corner of south wall projecting over the cliff; G, return wall overthrown; H, site of tower in north wall; I, surface of subterranean building.

left by the Romans in Britain and elsewhere, were constructed on the general model of their stationary encampments (*castra stativa*) see CAMP; ENCAMPMENT); and though they may have suggested the castles of the middle ages, they differed from them in being designed for military purposes only, and not also as places of permanent residence. Even Burgh castle, in Suffolk, anc. Garamonium, and Richborough castle, in Kent, anc. Rutupiæ, were en-

campments or fortresses, rather than castles. The accompanying ground-plan, from Roach Smith's work on the *Antiquities of Richborough* and other places in Kent, shows the form of the remains of the most remarkable Roman castellated fort in Britain.

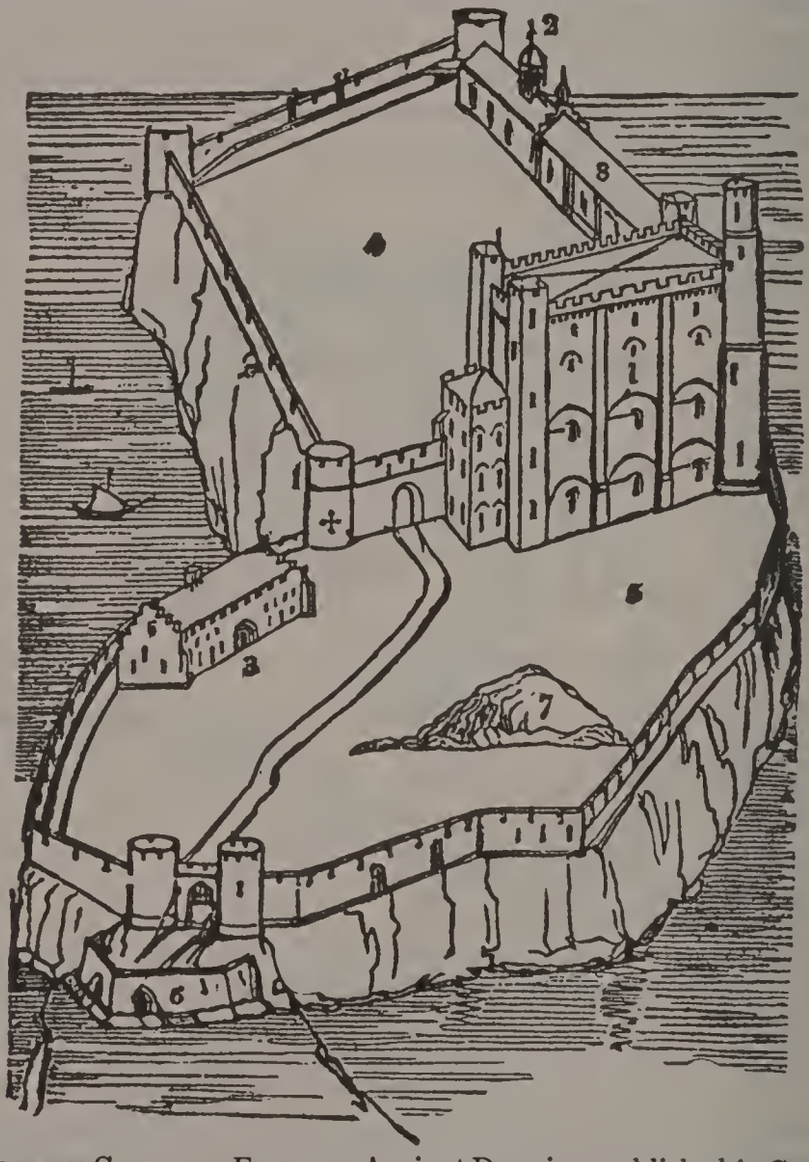
Besides these monuments of the military occupation of the island by the Romans, traces are found in various parts of the country of encampments or castles, which are ascribed to its aboriginal or early inhabitants. These are generally on the tops of hills; as, for example, the Herefordshire beacon, on the Malvern hills; Moel Arthur, in Flintshire; Chem castle, in Cornwall; the Maiden castle, in Dorsetshire; the Caterthuns, near Brechin, in Forfarshire; the Barmkin of Echt, in Aberdeenshire. It is probable that the Saxons adapted the Roman castles to a certain extent to their modes of defense, and traces of Saxon, and even Norman workmanship are found in structures believed

Roman Castellum.—From Vatican Virgil.

to have been originally Roman. One very frequent change consisted in raising a mound of earth on one side of the walls on which the keep or citadel was erected. The Decuman and Prætorian gates were also, as at Portchester, converted into the fortified entrances peculiar to the castellated structures of the middle ages. But of castles designed for residence as well as defense, there are few or none of higher antiquity than the Conquest. They were part of the organization of the feudal system—castle-guard being one of the duties which the tenants were held bound to pay in return for their lands; and till that system was developed by the Normans the residences of persons of importance were probably guarded only by their domestic retainers, or, in extraordinary circumstances, perhaps by the national militia. The absence of strongholds is said to have been a reason why William the Conqueror so easily became master of the kingdom; and it was as a protection against the resentment which the Conquest occasioned that most of the great Norman castles of England were built. As these castles grew in strength by the additions and improvements of each generation, they afforded their possessors the means not only of security from their fellow-

subjects, but of independence as regarded the central government. The lord of every castle became a petty tyrant; and no small portion of the history of England, and, indeed, of Europe altogether, during the feudal period, consists of an account of the attempts which were made by the monarch to destroy what Matthew Paris has emphatically designated as 'these nests of devils and dens of thieves.' Of castles of this description, it is said that in England, in the reign of Stephen (1135-54), no fewer than 1115 were built.

The Norman castle, the most complete structure of the kind, was generally surrounded by a moat or ditch; and in



A Norman Castle.—From an Ancient Drawing published in Grose's *Military Antiquities:*

1. The Dungeon; 2. Chapel; 3. Stable; 4. Inner Bailey; 5. Outer Bailey; 6. Barbican; 7. Mount; 8. Soldiers's Lodgings. The Mount is supposed by Grose to be the Court-hill, where the lord dispensed justice, and where it was also executed.

order that the ditch might be readily filled with water the site chosen was usually either on the banks of a river or on a peninsula running into a lake. In the latter case the ditch was merely a deep cut made through the neck of

land, by means of which the castle and its surroundings were converted into an island. On the inner side of the ditch mounds were constructed, surmounted with walls and towers, both of which, particularly the towers, were supplied with battlements and bastions. The entrance-gates also were protected by towers, usually of great strength. The communication was by a bridge, sometimes of stone, usually of wood, which was made to draw up and down; and the entrance, in addition to thick folding-doors, was protected by a portcullis (q.v.), which was dropped down through grooves in the masonry at the sides. The gateway, in castles of the larger sort, was further defended by a barbican (q.v.). Passing the external wall, one entered the bailey (q.v.), which sometimes consisted of several courts, and contained the barracks, magazines, well, a chapel, and sometimes even a monastery. The only portion of the castle which was always spoken of as distinguished from the bailey, was the keep (q.v.) or citadel, which corresponded to the prætorium of the Roman fortification. The keep was a species of internal castle, more strongly defended than any other portion of the fortress, and placed in the most advantageous position, so as to afford a last resort to the garrison when driven from the external works. As the keep had the same design as the castle itself it contained most of its appliances, even to a chapel, when large and complete. The keep was also called the dungeon or donjon (q.v.). An excellent example of a keep is seen at Rochester castle. The best known is probably that at Windsor, so prominent an object in the surrounding landscape. The protection which the walls of the castle afforded to the retainers of a baron, in a state of society in which life and property were extremely insecure, naturally led to the construction of houses around the moat, and to this custom a very large number of the towns in England and on the continent of Europe owe their origin. Along the banks of the Rhine, this process of town-formation may be seen in all its earlier stages; from the few peasants' houses and the village church nestling under the ivy-covered ruin on the cliff, to the large and prosperous city of Coblenz. Strange as it may seem, the existence of these castles may be regarded not only as a cause, but as an effect of a certain feeling of security on the part of the surrounding population; for where a country was thoroughly insecure, the risk of the castles falling into the hands of the enemy, and thus proving a source not of protection but of oppression, was so great as to prevent their erection. It is on this ground that Sir Walter Scott explains the slight character of the fortresses on the Scottish border, notwithstanding centuries of warfare. 'It was early discovered that the English surpassed their neighbors in the arts of assaulting and defending fortified places. The policy of the Scotch, therefore, deterred them from erecting upon the borders buildings of such extent and strength, as being once taken by the foe, would have been capable of receiving a permanent garrison.

To themselves, the woods and hills of their country were pointed out by the great Bruce as their safest bulwarks; and the maxim of the Douglases, that "it was better to hear the lark sing than the mouse cheep," was adopted by every border chief.' For these reasons, 'we do not find, on the Scottish borders, the splendid and extensive castles which graced and defended the opposite frontier. The Gothic grandeur of Alnwick, of Raby, and of Naworth, marks the wealthier and more secure state of the English nobles.' The residence of the Scottish chieftain 'was commonly a large square battlemented tower, called a *keep* or *peel*, placed on a precipice, or on the banks of a torrent, and if the ground would permit, surrounded by a moat.' (Introduction to Scott's *Minstrelsy*). See the very valuable work by G. T. Clark, *Mediæval and Military Architecture in England* (2 vols. 1884).

CASTLE GARDEN: in New York; extreme s. point of Manhattan Island, on the Battery Park. It was originally the site of an earthwork fortification erected by the early Dutch settlers; was gradually enlarged and converted into a stone fort of great strength in its day; and for many years was the official residence of the Dutch govs. of New Amsterdam. The English, capturing it, named it Fort James; the Dutch, recapturing it, called it Fort William Henry. After the revolutionary war the fort was demolished; 1805 a new one was built and named Castle Clinton; and in 1847 the place was turned into a pleasure resort under its present name. During 1855-1891 it was used by the N. Y. Board of Emigration as a landing depot, and the federal govt., taking charge of emigration matters in New York, opened a new landing depot on Ellis Island (1892). The old fort in 1896 was made a public aquarium.

CASTLEMAINE, *kas'sl-mān:* town of Australia, province of Victoria, at the junction of Barker's and Forest creeks, 65 m. n.w. of Melbourne, with which it is connected by the Victoria railway. It was a place of importance in the early days of gold mining, the neighboring mines being among the first discovered. Pop. 6,082.

CAS'TLE PEAK: one of the peaks of the Sierra Nevada, Cal., n. lat. abt. 38° 10′, whose outline, from some points of view, roughly suggests a fortress. Its height is estimated 13,000 ft.

CASTLEREACH', Lord: see Londonderry, Marquis of.

CASTLES, in Heraldry: often given as charges in the shields of persons who have reduced them, or been the first to mount their walls in an assault. The practice of heralds, in this as in other respects, has not been consistent, as it is recorded that in 1602 a castle was granted by William Cambden, Clarenceux king of arms, to William Frear, doctor of physic.

CASTLETON (N. Y.): see Staten Island.

CASTLETOWN, *kăs'sl-town:* formerly the capital and seat of government of the Isle of Man; called in Manx *Balley Cashtal*, or the Town of the Castle. Castletown is on the margin of Castletown Bay, near the s. extremity of the island, and surrounds Castle Rushen, a Danish fortress of prodigious strength, having walls from 12 to 18 ft. in thickness, built of limestone found on the spot, which is of so imperishable a nature that the sharp angles of the keep retain the marks of the builder's chisel, though completed in the 10th c. The castle was founded by Guthred II. of the Orrys kings of Man, and having been added to from time to time it is now an impressive pile of building. It underwent a six months' siege by Robert Bruce 1313. The keep is used as the public jail of the island, and the other portion of the castle consists of public offices, officers' apartments, and accommodation for the chancery and other superior courts.

Being in the neighborhood of the bold coast scenery of the Calf of Man, Spanish Head, etc., Castletown is a desirable resort for the numerous tourists who frequent the Isle of Man. Ship-building has of late made progress. Near Castletown is King William's College, founded 1830. Pop. 2,500.

CASTOCK, n. *kăs'tŏk* [a corruption of *kale-stock*]: in *Scot.*, the core or pith of a stalk of coleworth or cabbage; the stalk itself; also spelled CUSTOCK.

CASTOR, n. *kăs'tŏr* [L. *castor*—from Gr. *kastōr*, a beaver]: a beaver; also a drug taken from it. CAS'TORINE, n.: see under CASTOREUM.

CASTOR [Lat. myth. name]: see CASTOR AND POLLUX.

CASTOR, *kăs'tŏr*, ANTONIUS: 1st. c.: Roman botanist, reported to have lived in health for more than 100 years. Pliny quotes him. His botanical garden is the earliest known.

CASTOREUM, n. *kăs-tōr'ĕ-ŭm* [L. *castŏrĕum*, a secretion of the beaver—from *castor*, a castor or beaver]: a substance secreted from the follicles in two glandular sacs, closely connected with, but quite distinct from, the organs of reproduction in the beaver (q.v.), and at one time held in the highest repute in medicine, although now regarded as almost inert, and chiefly used by perfumers. The castoreum sacs are pear-shaped, and it appears in commerce in these sacs themselves, connected in pairs as they are taken from the animal. Castoreum is produced both by the male and by the female beaver.

In Hudson's Bay commerce, ten pair of them are equal in value to one beaver skin. Russian castoreum is of much higher value than American. Castoreum was well known to the ancients. From the time of Hippocrates it was regarded as having a specific influence over the uterus, and is still in use in the n. of Europe. It was formerly esteemed a most valuable medicine also in hysteria, catalepsy, and other spasmodic diseases. CAS'TORINE, n. *-tŏr-ĭn*, a chemical substance contained in castoreum.

CASTORIDÆ, *kăs-tor'ĭ-dē:* family of *Mammalia*, of the order *Rodentia*, of which the beaver (*Castor*) is the type, and in which, besides the beaver, the coypu (*Myopotamus*) and the *musquash*, some naturalists include other genera commonly regarded as belonging to the Mouse and Rat family (*Muridæ*), as the lemmings and voles.

CASTOR-OIL, n. *kăs'tŏr-oyl* [said to be a corruption of *castus-oil*, the sacred oil; but perhaps only an adaptation of *castor*, the drug from the beaver (see CASTOREUM)]: fixed oil obtained from the seeds of the C. O. plant. The seeds are first bruised between heavy rollers, and then pressed in hempen bags under a hydraulic or screw press. The best variety of oil is thus obtained by pressure in the cold, and is known as *cold-drawn* C. O.; but if the bruised and pressed seeds be afterward steamed or heated, and again pressed a second quality of oil is obtained, apt to become partially solid or frozen in cold weather. In either case the crude oil is heated with water at 100° C., which coagulates and separates the albumen and other impurities. Exposure to the sun's light bleaches the oil, and this process is resorted to on the large scale. When pure and cold-drawn, C. O. is of a light-yellow color; but when of inferior quality, it has a greenish, and occasionally a brownish, tinge. It is somewhat thick and viscid. Its specific gravity is high for an oil, being about 0.969. It dissolves in its own volume of absolute alcohol. This serves as a test for its purity. Exposed to the air, it very slowly becomes rancid, then dry and hard, and serves as a connecting link between the drying and non-drying oils. It has a nauseous smell, and an acrid, disagreeable, and sickening taste, which may be overcome by the addition of a little magnesia. The principal acid present in it is *ricinoleic* acid, $C_{17}H_{32}(OH)C_{17}O_2H$, which is allied to oleic acid.

C. O. is one of the most convenient and mildest of purgative medicines. Given in doses of one or two teaspoonfuls with a little peppermint-water, it forms a gentle laxative for habits easily acted on by medicine; while a dose of a tablespoonful, or a little more, will almost always succeed if it remains on the stomach. The only serious objections to the use of C. O. are its disagreeable flavor and the sickness often produced by it; some persons can avoid this by floating the oil in hot coffee, which is said to remove its nauseous quality. C. O. is sometimes adulterated with lard or croton oils. In addition to its medicinal uses it is largely employed in the process of TURKEY RED DYEING (q.v.).

The CASTOR-OIL PLANT (*Ri'cinus communis*) is native of the s. of Asia, but now naturalized in the s. of Europe, and other warm regions of the globe. The genus *Ricinus* belongs to the nat. ord. *Euphorbiaceæ*. It has panicled flowers, with 3–5 partite perianth; the fruit a tricoccous capsule, with one seed in each cell, the outside of the capsule generally covered with soft spines. The castor-oil plant is often cultivated in gardens in the middle, and

even in the n. parts of Europe, where it is only an annual, attaining a height of 3–10 ft., but highly ornamental by its stately growth, its large, broad, palmato-peltate, 7–9-fid leaves, ¾–2 ft. in diameter, and its generally purplish hue. Its flowers are produced in long glaucous racemes. In warmer climates it is perennial, and its stem becomes arborescent, attaining even 30 ft. in height, with a corresponding thickness, so that ladders are used for climbing it. Different species which have been described, are probably mere varieties. It was known to the ancients, and appears to have been valued by them. Its seeds have been found in Egyptian sarcophagi. From the

Castor-oil Plant:
a, end of a branch, with leaves and flowers; *b*, a capsule.

resemblance of its seeds to an insect caled *Ricinus* it received that name from the Romans. The seeds are oval, and about four lines long. They are valued chiefly for the oil which they yield, on account of which the plant is cultivated in the Levant, Spain, Provence, the West Indies, Brazil, the United States as far north as New Jersey, and in other tropical or warm temperate countries. Although castor oil is used chiefly in medicine, it is not unfit for lamps and for oiling the wheels of machinery. The streets of Lima are lighted, and the machines used in the works of the sugar-plantations of Peru are oiled with it. The appearance of the castor-oil plant obtained for it the name of *Palma Christi*.

CASTOR and POLLUX, *kăs'tŏr, pŏl'lŭks* [Latin mythical names]: the two principal stars in the constellation Gemini, (q.v.); so called from Castor and Pollux, sons of Leda and of Tyndareus who was king of Lacedæmon; another legend was that they were sons of Jupiter by Leda. Their sister was the famous Helen of Troy. The legend was that on account of their mutual attachment, Zeus placed them among the stars. See DIOSCORI.

CASTOR AND POLLUX, *kăs'tŏr, pŏl'lŭks* [Latin mythical names]: name given to a meteor seen at sea, which, under the form of twin balls of fire, attaches itself to the masts of ships. Sailors predict fair weather from its appearance. Sometimes, however, only one ball of fire is seen; the meteor is then called Helena, and it is regarded as foreboding a storm. Shakespeare makes mention of this superstition in the *Tempest* (act. i., scene 2).

CASTORS, n. *kăs'tŏrs* [see CASTERS]: small wheels on the legs of tables, sofas, etc.

CASTRAMETATION, n. *kăs'tră-mē-tā'shŭn* [L. *castra*, a camp; *metor*, I measure]: the art or practice of encamping: see CAMP: ENCAMPMENT.

CASTRATE, v. *kăs'trāt* [L. *castrātus*, deprived of generative power: to deprive of the power of procreation; to emasculate; to geld. CAS'TRATING, imp. CAS'TRATED, pp. emasculated; purged. CASTRA'TION, n. *-trā'shŭn*, the act of emasculating: in males the removal of the testicles; in females, the removing or mutilating of the ovaries (known as 'spaying'): see EUNUCH.

CASTREL, n. *kăs'trĕl* [F. *crecerelle*]: a kind of hawk, resembling the sparrow-hawk: same as KESTREL.

CASTREN, *kâs-trān'*, MATTHIAS ALEXANDER: 1813–1852, May 7; b. near the Lappish boundaries of Finland; greatest authority in regard to the Finnish people and language. He received his earliest instruction in the town of Tornea, and afterward studied at Helsingfors. About 1838, he undertook a pedestrian excursion through Finnish Lapland in order to extend his knowledge of the language and literature; and, in 1840, another through Carelia, to collect ballads, legends, etc., illustrative of Finnish mythology. On his return, he published in Swedish a translation of the famous Finnish poem, *Kalevala*, the metre and style of which have been imitated by Longfellow in his poem of *Hiawatha*. Aided by the government of his native province he commenced his researches among the Finnish, Norwegian, and Russian Laplanders, and among the European and Siberian Samoyeds. Appointed linguist and ethnographer to the St. Petersburg Acad., Castren, 1845–49, prosecuted his investigations as far e., as China, and as far n. as the Arctic Ocean, and, returning was appointed first prof. of the Finnish language and literature at the Univ. of Helsingfors. While preparing for publication the vast materials which he had collected, he died from exhaustion—a martyr to science. Before his death, appeared *Versuch einer ostjakischen Sprachlehre nebst*

kurzen Wörterverzeichniss (St. Petersburg, 1849), first instalment of his *Northern Travels and Researches*. He also wrote *Elementa Grammaticæ Syrjaenæ* (Helsingfors, 1844), and *Elementa Grammaticæ Tscheremissoe* (1845); *On the Influence of the Accent in the Lappish Language* (St. Petersburg, 1845), etc.

CASTRES, *kâst'r:* town of France, dept. of Tarn; on both sides of the river Agout, 46 m. e. of Toulouse. The two parts of the town are connected by two stone bridges. In the middle ages Castres was celebrated for its Benedictine abbey, the heads of which exercised a temporal sway over the place. Later it was one of the strongholds of the reformed party, but was forced to submit, and its fortifications were demolished in the reign of Louis XIII. Castres has beautiful promenades shadowed by fine alleys of trees. Castres is a busy manufacturing place. Its fine wool-dyed goods are especially famous, and it has also manufactures of linen, leather, paper, soap, etc. Pop. about 20,000.

CASTRO, Cipriano, *kâs'tro sē'preâ-no:* President and director of Venezuela; b. near Capacho, 1858. His parents were mestizo peasants, but he received a fair elementary education, and afterward engaging in the occupation of a rancher and coffee-grower, he became prominent in local politics as a liberal. He participated as an officer in the battle of Capacho (1886), and in Crespo's rebellion against Andueza (1892). The latter year he was elected to the Federal Congress from the State of Tachira, and came into prominence as a forcible speaker and writer on public questions. Subsequently he refused an appointment in Crespo's cabinet, and retired to his ranch near San Cristobal, on the Colombian frontier, protesting against the unfair taxation of the country provinces by the politicians of the capital; and in 1899, when an effort was made at the wholesale confiscation of his estates, he raised the standard of revolt. Within a few weeks he had collected a band of followers, clad in straw shoes and armed with short swords, and taking possession of the state capital he was proclaimed president of Tachira. In 1900 public affairs had reached a very unsatisfactory state under the administration of President Andrade, Crespo's successor, and Castro was invited by the discontented leaders to march upon the federal capital. He set out with eighty men and was joined on the way by about six hundred mixed troops, with which force he gained admission to Caracas and was formally elected president of the republic. He soon came into conflict with the United States and several foreign powers, in consequence of unpaid claims against his country, and in 1901 he organized a commission to consider all such claims with a view to their adjustment. An unsuccessful revolution under General Matos delayed this movement, and in 1902–1903 Great Britain, Germany and Italy blockaded Puerto Cabello and bombarded the fort at that place. An arrangement was finally effected by which all claims were referred to the Hague Tribunal

for adjudication, and 30 per cent. of the import revenues of La Guaira and Puerto Cabello were assigned for the payment of such of the claims as were confirmed by the Court. The character of some of the claims may be inferred by the fact that those of the United States, aggregating $15,723,081, were reduced by the court of arbitration to $459,457. But even after this sweeping reduction the revenues which had been assigned to the payment of the claims were found to be inadequate, and a period of financial depression ensued, entailing delays in the settlement of the obligations. In 1905 Castro became embroiled with the U. S. over two claims which he peremptorily refused to take out of the Venezuelan courts and submit to arbitration, and for a time an open rupture between the two countries was feared; but at length the justice of the position assumed by the Venezuelan President was recognized, and the cases were allowed to continue to final adjudication in the courts of that republic. On 1905, June 7, Castro was re-elected President.

CASTRO, Henri: 1786–1861; b. in France, of Portuguese descent. He was an officer of the national guard, emigrated to the United States 1815, and was Neapolitan consul at Providence, R. I., 1827, but returned to Paris 1838 as partner in Lafitte's banking house, and was consul-gen. there for the republic of Texas 1842. Castro acquired a grant of land on the Medina river, began 1840 to send emigrants to Galveston, and founded Castroville, Quihi, Vandenburg, and Dhanis, all in what is now Medina co., Tex., 1844–47. By 1846 he had sent over 26 vessels with 485 families and 457 unmarried persons.

CASTRO, *kâs'tro*, Ines de: d. 1355; daughter of Pedro Fernandez de Castro, and sprung from a branch of the royal family of Castile: her mournful fate is the subject of several tragedies and poems. She was appointed lady-in-waiting to the wife of Dom Pedro, son of Alfonso IV. of Portugal. Her beauty captivated Dom Pedro, and, after the death of his wife, 1345, he secretly married Ines. Their stolen interviews took place in the convent of St. Clara, at Coimbra, until the secret was discovered and revealed to the king, who was made to believe that this union might prove injurious to the young Ferdinand, son of Dom Pedro by his deceased wife. Questioned by his father, Dom Pedro had not the courage to reveal the whole truth, though he refused to marry another. In the king's council, it was determined that Ines must die. To see this sentence executed the king hastened to Coimbra, while his son, Dom Pedro, was engaged in hunting, but the sight of the beautiful Ines, who, with her children, cast herself at the feet of the king, and prayed for mercy, diverted him for a few moments from his purpose. His advisers, however, soon obtained from the king permission to execute the sentence, and, in the course of an hour after the interview Ines fell pierced by the daggers of assassins. Dom Pedro attempted a revolt against his father, but was pacified by the queen and the Abp. of

Braga, and promised not to seek revenge for the death of Ines. Two years afterward the king died, having shortly before his death recommended the murderers of Ines to leave Portugal and seek shelter in Castile, where Peter the Cruel was then ruling. As several of Peter's nobles had escaped into Portugal to avoid his oppression, Peter proposed to Dom Pedro an exchange of fugitives, to which the latter (now king of Portugal) consented. Two of the assassins accordingly were delivered up, and were tortured and burned. Two years afterward, the king, in an assembly of the nobility, declared that he had been lawfully married, by papal sanction, and in the presence of the Abp. of Guarda, to Ines de Castro. When this statement had been confirmed by several testimonies the king gave orders that the corpse of Ines should be removed from its grave, clothed in royal attire, with a crown on the head, and seated on a throne, should receive homage as queen. This strange ceremony was performed, the nobles of Portugal bowing before the enthroned dead, and kissing the hem of the royal robe. The body was then removed to Alcobaça followed by the king, with the bishops and the nobility, all on foot. A splendid marble monument was erected over the grave of Ines, surmounted by her statue, wearing a crown.

CASTRO, Joao de: fourth viceroy of the Portuguese Indies: 1500, Feb.—1548, June 6; b. Lisbon; son of its civil gov. A brilliant scholar in youth, he served at Tangier 1518 and 1535, with his friend the Infante Dom Luis, at the siege of Tunis, where he refused knighthood from Charles V. Though of ancient lineage, lofty character, and distinguished gallantry, he was very poor, and to improve his fortunes went to Goa abt. 1539 with his uncle, G. de Noronha, enlisted among 'the bravest' for the relief of Diu, and explored the Red Sea under E. de Gama, who knighted C.'s son, a boy of 13 years, in compliment to the father. Returning to Portugal he was put, 1543, in command of a fleet against the pirates, and 1545 sent with six ships to India in place of De Souza. His last three years were filled with severe labors and brilliant exploits. One of his sons was killed before Diu, but he drove the Moors from that town 1546, overthrew Mahmoud, King of Cambodia, defeated Adhel Kahn's great army, took Baroach, subdued Malacca, and sent Meniz into Ceylon. Camoens celebrated him as *Castro forté*, the strong. John III., who did not favor him, was constrained to reward his great services by the appointment of viceroy, 1547, Oct. 18. He died at Goa in the arms of his friend St. Francis Xavier. A statue was erected at Goa in his honor; his bones were removed 1576 to the convent of Bemfica, Portugal, and placed under a monument. He left MS. accounts of his voyages to Goa and Diu. A life of him by De Andrada, 1651, was translated into English by Sir Peter Wyche 1664.

CAST-STEEL: term, until lately, confined to steel made by melting blister-steel (q.v.), obtained by the old cementation process. Through this simple operation of melting it

in crucibles, which was invented by an Englishman named Huntsman about the middle of last c., steel was first readily made perfectly homogenous, and fitted for the production of the finer kinds of tools and cutting instruments. The crucibles are made of fire-clay, mixed with a small proportion of the material of old ones and coke. They are very carefully prepared and annealed, but, notwithstanding this, the heat of the furnace is so high that they can be used only three times. Each crucible contains 30 to 40 lbs. of steel, which is poured, when melted, into cast-iron ingot-molds previously smoked. The name 'cast-steel,' however, is no longer confined to steel so made, because Bessemer steel, though produced by a quite different process, is truly a cast-steel. In Sheffield, the finer kinds of cast-steel are now sometimes called 'crucible steel;' but since puddled steel, which, like the Bessemer, cannot be used for fine cutlery, is also cast in crucibles, such a term is not sufficiently distinctive.

CASTUERA, *kâs-tô-ā'râ:* town of Estramadura, Spain, 68 m. e.s.e. of Badajoz; near the right bank of the Guadalefra. It has several good streets, manufactures of brick, earthenware, etc., and a trade in agricultural produce; some weaving is done. Pop. 6,870.

CASUAL, a. *kăzh'ū-ăl* [F. *casuel*—from L. *casŭālis*, fortuitous—from L. *cāsus*, a fall]: happening without design; coming to pass without being expected or foreseen; accidental. CAS'UALLY, ad. *-lĭ*, without design or purpose; accidentally. CASUALTY, n. *kăzh'ū-ăl-tĭ*, an injury or hurt to the body by accident; death or other misfortune by accident. CASUAL-WARD [shortened from *casualty-ward*]: in a hospital, a ward assigned to the treatment of injuries from accidents.—SYN. of 'casual': accidental; incidental; contingent; occasional; fortuitous.

CAS'UAL POOR: persons temporarily relieved without being admitted to the roll of permanent paupers: see POOR-LAWS.

CAS'UALTIES OF SUPERIORITY: in the feudal law of Scotland, such emoluments arising to the superior as depend on uncertain events: see WARD-HOLDING.

CASUARINA, *kăz-u-ar-ī'na:* genus of trees of the nat. ord. *Amentaceæ*, sub-ord. *Casuarineæ*, which sub-ord. is regarded by some as a distinct order. The trees of this genus are almost exclusively Australian; one only, *C. equisetifolia*, being found in the South Sea islands, the Indian archipelago, the Malayan peninsula, and on the e. side of the Bay of Bengal as far n. as Arracan. Some of them are large trees, producing timber of excellent quality, hard and heavy, the *Beef-wood* of the Australian colonists, so called from the resemblance in color to raw beef. *C. equisetifolia* is called in Australia the SWAMP OAK. It is a lofty tree, the *Toa* or *Aitoa* of the Society Islands, where it grows chiefly on the sides of hills, and where its wood was formerly used for clubs and other implements of war. It has been introduced into India and is there much valued, as its wood bears a great strain, and is not readily injured by submersion in

water. The hardness and durability of this wood led the earlier voyagers to the South Sea islands to designate it *iron wood*. *C. quadrivalvis* is the SHE OAK of New South Wales. CASSOWARY TREE is a popular generic name of the *Casuarinæ*. Some of the species are shrubby bushes. All of them have a very peculiar appearance, their branches being long, slender, wiry, drooping, green, jointed, with very small scale-like sheaths instead of leaves. They resemble arborescent *Equisetaceæ*. The fruit consists of hardened bracts, collected in a *strobilus*, or cone, and inclosing small winged nuts. The flowers have neither calyx nor corolla; the stamens and pistils are in separate flowers, the male flowers with only one stamen, the female flowers with a one-celled ovary, the male flowers in spikes, the female flowers in dense heads. More than 20 species are known.

CASUIST, n. *kăzh′ū-ĭst* [Fr. *casuiste*, a casuist—from Sp. *casuista*—from L. *cāsus*, a case]: one who reasons on *cases* put; one who resolves doubts of conscience in matters of duty. CAS′UIS′TIC, a. *-ĭs′tĭk*, or CAS′UIS′TICAL, a. *-tĭ-kăl*, pertaining to casuistry; relating to cases of conscience. CAS′UIS′TICALLY, ad. *-lĭ*. CASUISTRY, n. *kăzh′ū-ĭs-trĭ*, the science or system of rules that undertakes to decide in matters of conscience as to what is lawful or unlawful; the art of quibbling; the art of drawing fine distinctions.

CASUISTRY, *kăzh′u-is-trĭ*, called by Kent the *dialectics of conscience:* that branch of theology and morals which professes to deal with very delicate moral questions—*casus conscientiæ*—and which supplies rules and principles of reasoning for resolving the same; drawn partly from natural reason and equity and partly from the authority of Scripture, the canon law, councils, fathers, etc. Casuistry has been, and still is, studied chiefly by Rom. Cath. theologians; but at one period Protestant divines also gave much attention to the science. The rudiments of it are seen in antiquity. Traces of it are found in the Stoic philosophers of ancient Greece. This is not to be wondered at, for Casuistry is not, in its essence, a device of the schoolmen, though the latter elaborated it into a science, but a natural expression of the intellect and moral nature of man when in circumstances of great perplexity. The sound and healthy reason of antiquity, however, was not usually under sufficient stress of conscience to be drawn into the morbid refinement, or rather the insidious corruption of morals found in certain Jewish and Christian writers. The *Talmud* (q.v.) contains an enormous accumulation of casuistical questions, while the sphere of Christian ethics in the middle ages often became a mere arena for unprofitable and pernicious disputations of this nature, as is seen in such works as the *Summa Raymundiana*, *Summa Astesana*, *Summa Bartholina*, which obtained their names from their respective compilers. At a later period, the Jesuits Molina, Escobar, Sanchez, Busenbaum, etc., became notorious for their abuse of ingenuity in the construction of moral puzzles, and for the flagrant

immorality of some of their solutions, which still 'suffer the vengeance' of Pascal's immortal satire. It is nevertheless indubitable that in the life of every man—now as formerly—*casus conscientiæ* will at times arise, when the higher laws of morality come into collision with subordinate conventional ones. The doubt as to what the path of duty is, what *ought* to be done, resulting from this collision, naturally and legitimately leads to many nice considerations. If these are carried on under the guidance of a pure conscience, no harm can ensue, but indeed, much good. Such, however, is not the *perverted casuistry* 'the art of quibbling with God,' as M. Le Feore, preceptor to Louis XIII., called it, in which a man seeks to justify, by subtle quirks, his immoral actions. The essential error in casuistry is that it endeavors on the one hand to maintain a set of fixed moral principles, and on the other to keep in touch with changing moral conditions. The circumstance really demands, either that the moral standards should be revised or that the new conditions should be denied. The casuist, however, endeavors to be both conservative and radical at the same time. Consequently he is driven to such varied devices in squaring new interests with old rules that he violates both his moral nature and his intellectual integrity. Mayer has published an account of all the writers on cases of conscience, ranging them under three heads—Lutheran, Calvinistic, and Romish—meaning by the last, writers in the Roman Church, or those Protestants who followed the manner of some writers of that church; for it is to be remembered that the 'perverted casuistry' was characteristic of only a class.

CASUS BELLI, *ka'sŭs bĕl'lī*, a case of war: the reason alleged by one power for going to war with another. It is found impossible to reduce these causes or reasons to any definite code, inasmuch as an ambitious or aggressive power has no difficulty in *making* a reason to declare to others, without acknowledging the real reason.

CASWELL, Richard: 1729, Aug. 3—1789, Nov. 20; b. Md.; patriot. He removed to N. C. at the age of 17, was a member of the assembly 1754–71, and for the last year speaker of the house. As col. of militia he commanded Gov. Tryon's right wing at the battle of Allemance, 1771, May 16. Embracing the cause of liberty, he was a delegate to congress 1774–5; treasures of the s. dist. of N. C. 1775, Sep.; president for three years of the provincial congress, which during that time framed the state constitution; and gov. 1777–79. As col. of minute-men he defeated the loyalists under McDonald at Moore's creek 1776, Feb. 27, and was thanked by congress and appointed gen. He was engaged at Camden 1780, made speaker of the senate, comptroller-general 1782, again gov. 1784–86, member of the convention which framed the federal constitution 1787, and of that in N. C. which ratified it 1789. He was struck with paralysis 1789, Nov. 5 ,while presiding in the state assembly, and died at Fayetteville, North Carolina.

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